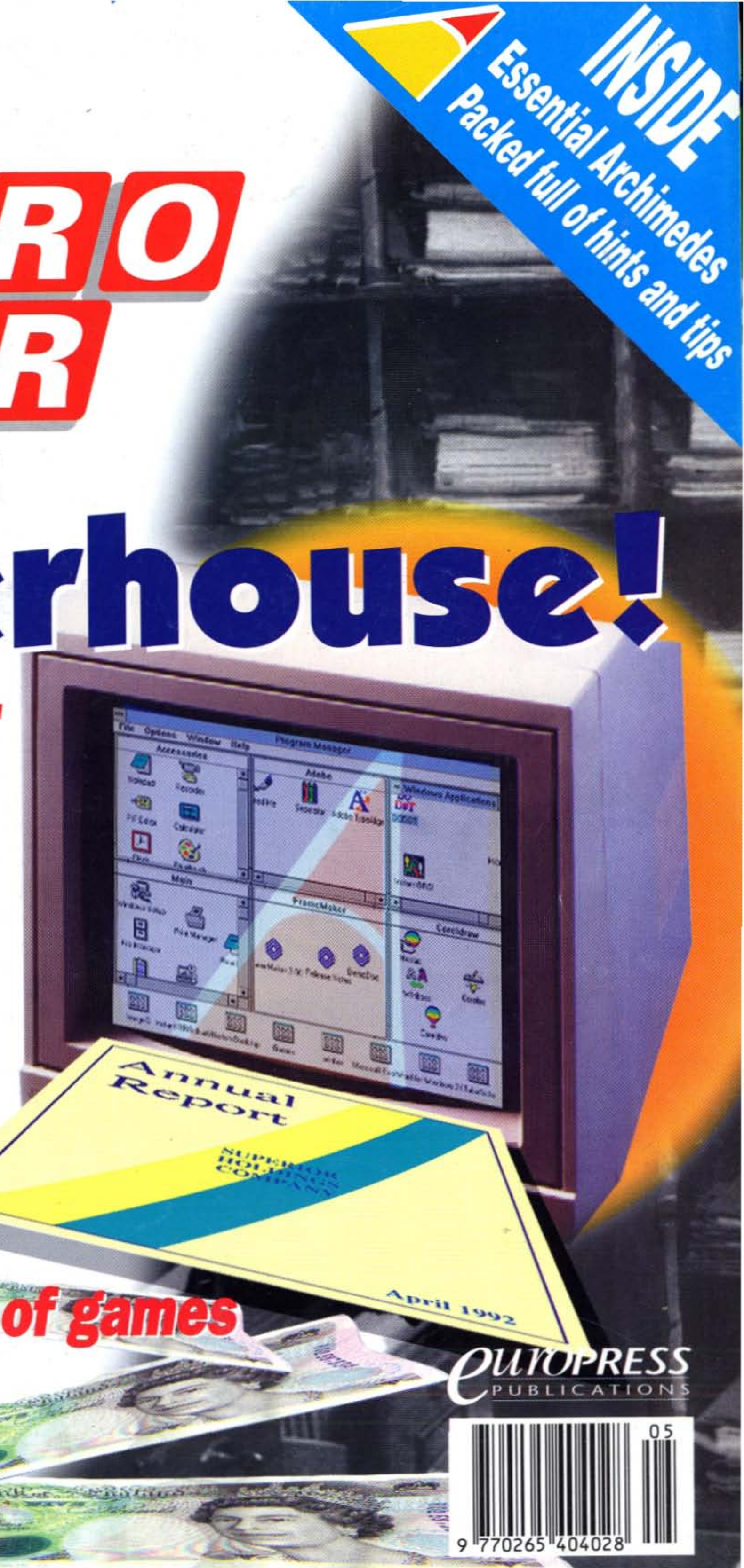
THE MICRO USER

Volume 10 Number 3 May 1992 £1.95

INSIDE
Essential Archimedes
Packed full of hints and tips

Powerhouse!

Windows booster plus much more to cash in on...



Annual Report
SUPERIOR HOLDINGS COMPANY
April 1992

GETTING SMART

Create your own designer T-shirt – in full colour

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europress PUBLICATIONS

BBC A3000 • Archimedes • BBC Micro • Master series

REMOVABLE, PORTABLE, EXPANDABLE AND SECURE

44 MEGABYTE
MORLEY

SOUNDS TOO GOOD to be true. Morley Electronics new removable cartridge hard disc systems can work on the A3000 through to the A540 (including the new A5000) as well as on BBC Master computers.

THE SECRET LIES in the hard disc cartridge which after dismounting can be taken out and stored, or be replaced by another cartridge within a few seconds. Security is so easy with these discs because you can simply take them home or lock them away.

THE UNIT can also be used as a backup system for internal hard drives as well. Once you have looked at the prices you will see that they are significantly cheaper than tape streamer sytems. Because they are a hard disc you also have virtually instant access to the information stored on them and as it is simply a matter of copying files from one disc to another instead of having to run lengthy restore programs to recover information from tape.

PERHAPS THE BIGGEST advantage of these units is that when one cartridge is full then all you have to do is purchase a new cartridge and not a whole mechanism saving you a small fortune in the process. The mechanisms can be either 44MB or 90MB, however please note that the cartridges are not interchangeable between the two.

THE MECHANISMS are true SCSI devices. Therefore, the interface card we can supply with the drives can have up to seven* devices attached such as CD-ROM drives, standard hard discs, flatbed scanners, tape streamers, etc. giving you maximum expandability for the future.

Specifications

- *20 Millisecond Access*
- *Data transfer up to 1.25MB/s*
- *Reliability of 30,000 hours MTBF*
- *8K Buffer*

A3000,300, 400, 5000, 540 & Master**

44MB Inc Interface Card	£575.00
90MB Inc Interface Card	£775.00
44MB Excl Interface Card	£499.00
90MB Excl Interface Card	£699.00
44 MB Cartridge	£69.00
90 MB Cartridge	£109.00

Please state computer type when ordering.
Prices exclude VAT and carriage.

Prices include mechanism, case, one cartridge, all necesary cables and software.
Prices excluding interface card do not include software.

** Master can only have one device attached.*
*** Please note that the 300 series machines require a MEMC1A upgrade and a backplane to be fitted, both available from Morley. Please call for prices.*

MORLEY
E·L·E·C·T·R·O·N·I·C·S · L·T·D

Control Software

SPARKLE is a RISC OS compliant control package for the A3000 and Archimedes allowing full control of input, output and motor devices via most control boxes. Effectively Sparkle introduces the user to the world of control through a simple language which gives full access to control boxes as well as the ability to carry out data and frequency logging via analogue equipment. Inputs and outputs are simulated on screen and the package includes full counting and timing facilities. Numerous exmples are included as are various exercises. Sparkle can control Deltronics, Phobox and Andi-Oddule control boxes as well as being the LEGO® dacta recommended control software for their Interface A control box. Please state control box when ordering.

Sparkle	£59.00
Sparkle for LEGO®	£59.00
Sparkle Site Licence	£200.00
LEGO® dacta Interface A Control Box	£120.00

Coming Soon...
The Octopus

Analogue & User Interface

FULL SPECIFICATION BBC analogue & user port for the A3000. The analogue port is accessable using ADVAL from BASIC 5 with all BBC OSbyte calls supported. *As supplied to Acorn Computers for their special access A3000.*

Analogue & User Port	£59.00

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MORLEY HARD DISC DRIVES and interfaces are now renowned throughout the Acorn community. A combination of the ***fastest and most compatible interface*** available, together with high quality drive mechanisms means you can be confident that you are making an investment for the future.

THE INTERFACE CARD is ***fully Acorn compatible and is the only ANSI level 1 & 2 compliant*** card on the market. It works with amongst others Fujitsu, Rodime, Quantum, Miniscribe and Connor hard disc drives as well as Wangtek tape streamers, Morley's own removable hard discs, Computer Concepts Scanlight Professional and is ***guaranteed to work with any ANSI compliant SCSI device.*** The card can give sustained data transfer rates of up to 4MB per/s. It is also fully compatible with RISC-OS 2 & 3 and fits the A3000, 300, 400, 540 and the new A5000 so when you upgrade machines you can hang on to your hard disc without any problems. If you already have a hard disc inside your computer but would like to have the benefits of a SCSI drive, our card lives quite happily alongside an existing ST506.

A3000 Fixed Hard Discs	
52MB	***£379.00***
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Other SCSI devices

150MB tape streamer	***£799.00***

All prices include standard interface card, all necessary software, cables and cases. For cached interface card please add £50.00

Morley Electronics Ltd

WE ARE an authorised Acorn dealer, Education dealer and service centre and have been making peripheral devices for Acorn computers since 1985. We are the only dealer in the North East with dedicated Acorn demonstration facilities. We are also registered dealers for Star and Citizen printers. This advert only carries prices for our own products so please call if you wish to receive prices for equipment which is not advertised.

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*(Adapter needs to be sent to Morley)

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SCSI & Devices ☐
Control ☐

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THE MICRO USER

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The Micro User is an independent publication and neither the BBC nor Acorn Computers Ltd are responsible for any of the articles in this issue or for any of the opinions expressed.

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✱ This symbol indicates that the feature contains at least one full length listing for you to key in on your micro. All programs for your machine are on the subscribers disc.

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Get it right ✓ All the major listings in this magazine are accompanied by checksums to help you key them in correctly. For full details of how to use them see the article on Page 86 of the February 1992 issue

Powerhouse!

Once it was true the Acorn 32 bit machines weren't suitable for business but now you need look no further for your commercial needs. The Archimedes can satisfy them all...

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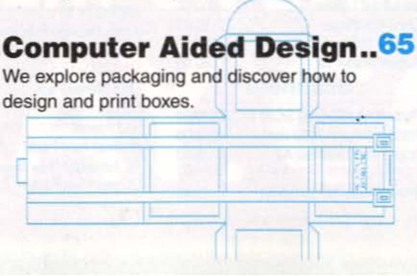

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THIS

OR

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ACT NOW – offer closes May 25th 1992
See Page 112 for further details

MAY SUBSCRIBER DISC

This month's discs are chock full of goodies from the program listings, public domain goodies and the Body Building course. The 8-bit BBC Micro disc is crammed with a brilliant DTP package. This month the Archimedes/BBC A3000 disc contains some amazing programs dedicated to producing and manipulating fractals. The disc has been checked for all known viruses. If you'd like to know more about how to get your very own disc each month then turn to Page 112.

Bargain basement

is open on Page 100

Hardware and software classifieds

NEXT MONTH IN THE MICRO USER

Discover the world of CD roms next month in The Micro User, the hardware, the software, how it works and what it means to you. Plus all our regulars and the great money-saving PD Page.

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Phone lines open :-
Mon - Fri 09.00 - 17.00
Sat 10.00 - 17.00

FAX: 061 766 8425

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A5000 Learning Curve as above c/w Audio Training Cassette, Guide to National Curriculum, Acorn Applications Suite, Pacmania, PC Emulator , Genesis, 1st word Plus, Acorn DTP	£1531.06
A5000 LC / Acorn Printer as above c/w Acorn JP150 Inkjet Printer	£1765.96
A3000 c/w 2Mb Ram fitted	£599.00
A3000 Learning Curve as above c/w Audio Training Cassette, Guide to National Curriculum, Acorn Applications Suite, Pacmania, PC Emulator, Genesis, 1st Word Plus	£642.29
A3000 LC / Acorn Monitor as above c/w Acorn Colour Monitor	£855.05
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Taxan 795 VIDC Modes Disc	£7.50
Technical Reference Manual	£65.00

A5000 Upgrades

2Mb Ram Card	£110.00
Technical Reference Manual	£65.00

A400 Upgrades

1 Mb Ram	£35.00
2 Mb Ram	£65.00
3 Mb Ram	£99.00
20 Mb Hard Disc (ST506)	£145.00
40 Mb Hard Disc (ST506)	£245.00
5.25" Ext. floppy disc int.	£39.00
ARM 3 Upgrade (Aleph 1)	£199.00
Econet Module	£46.00
VIDC Enhancer	£29.00

A3000 Upgrades

1 Mb Ram (2 Mb in total)	£55.00
4 Mb Ram	£159.00
20 Mb Int Hard Disc (IDE)	£199.00
5.25" External f/disc buffer	£39.00
Serial Upgrade	£19.00
Serial Link Kit (BBC-Arc)	£14.00
User & Analogue Podule	£46.00
User & Midi Podule	£46.00

Expansion Cards

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ArVis Video Graphics Board	£877.00
Chroma 345 Overlay Board	£389.00
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Midi Expansion Card	£65.00
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SCSI Expansion Card (Acorn)	£229.00

Standard Monitors

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All monitors come with free lead. State type of computer when ordering.

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^ comes with free VIDC enhancer.

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Printers

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Oak Products

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Midnight Graphics

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4 Mation

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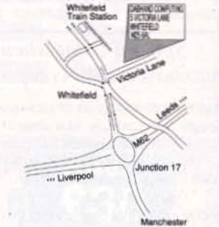

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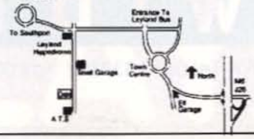

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8Mb Memory

- Uses only eight RAM devices
- Suitable for A440, A400/1 & R140
- Fully RISC OS compatible
- Four layer printed circuit boards
- Courier collection & fitting included

8 Mb upgrade - £499

410/1 Memory

- 400 series RAM upgrade kits
- Supplied with full fitting instructions
- 410/1 to 420/1 requires 1Mb
- 420/1 to 440/1 requires 2Mb
- 410/1 to 440/1 requires 3Mb

1Mb - £35 2Mb - £64 3Mb - £98

A310 Memory

- Includes free MEMC1a upgrade
- Four layer printed circuit boards
- Courier collection & fitting included
- Free MEMC1a while stocks last

2nd Mb - £99 4th Mb - £199
2nd to 4th Mb upgrade - £115

A3000 Memory

- Uses only eight RAM devices
- User upgradeable from 1 to 4 Mb
- Four layer printed circuit board
- Low power consumption
- Available without RAM devices

Bare card - £35
2nd Mb Card - £56 4th Mb Card - £159

A540 Memory cards

- Uses only eight RAM devices
- Four layer printed circuit board
- Three cards may be fitted giving a total of 16Mb of memory

A540 4Mb upgrade - £275
Two memory cards - £520
Three memory cards - £749

ARM3 Upgrades

- 3 to 4 times performance increase
- Surface mount technology
- Four layer printed circuit board
- Suitable for all ARM2 based machines

25MHz ARM 3 upgrade - £199
Collection delivery and installation on all machines - £35

A5000 Memory & Drives

- Increases A5000 memory to 4Mb
- Ugradeable from 4 Mb to 8Mb
- 4Mb to 8Mb price includes installation
- High quality Four layer circuit board
- No special tools required

A5000 4Mb RAM - £110 4Mb to 8Mb RAM - £399
A5000 2nd 105Mb IDE drive - £299

VIDC Enhancers

- Increases resolution with all Multiscan monitors
- Doubles desktop work area
- Custom modes for Taxan and Eizo monitors
- Includes Mode designer software
- Free with any multiscan monitor from Atomwide

VIDC Enhancer - £25 A540 mode software £5

Syquest removable disk systems

- Including One cartridge, drive unit and all cables
- 42Mb removable cartridges
- High-flow fan fitted for improved cooling

Atomwide Syquest drive unit - £425
Drive unit with Oak SCSI card - £599
Spare 42Mb disks - £55

Quantum SCSI Hard disc's

- Including drive, metalwork and all cables
- Fast 16ms access 64K cache
- slim line disc two drives may be fitted in one frame
- Available as internal or external units

52Mb internal - £199 105Mb internal - £299
210Mb internal - £599 425Mb internal - £949
Oak 16bit card - £175 External unit add - £75

DTP & Monitors

- Impression II DTP package **£130**
- Impression junior DTP package **£70**
- LBP4 printer including sheet feeder **£1045**
- Eizo 9060 **£399** - Eizo 9070 **£599** - Eizo T560i **£1025**
- Taxan 795 **£490** - Taxan 875 **£775**

All monitors come with a Free VIDC enhancer
Carriage on all monitors is £7

Acorn Machines

A5000 & A5000LC - Free 4Mb upgrade
A540 - Free 4Mb ram card giving 8Mb
A3000 & A3000LC - Free 2nd Mb RAM
A5000 - £1499 A5000LC - £1531
With Eizo 9070 monitor A5000 - £1699 A5000LC £1731
A3000 - £599 A3000LC - £642 A540 - £2495

Access

VISA

- All products are cross-compatible
- Combination deals available on all products
- Dealer enquires welcome
- Phone for full details on all products

All prices exclude VAT at 17.5% but include delivery with the exception of monitors

ATOMWIDE

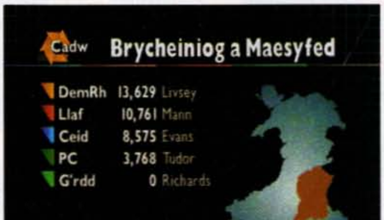
23 The Greenway Orpington Kent BR5 2AY Tel 0689 838852 Fax 0689 896088

NEWS BEAT

Vote for Acorn

NOW that the election is over, you may think you've escaped from politics – not so. Viewers of BBC Wales may well have noticed the graphic representation of the results and the graphic analysis on election night.

Usually such displays are created using conventional TV graphic tools such as Quantel Paintbox, but good though it is it can't manage animated bar charts without a lot of manual effort.



Cadw Brycheiniog a Maesyfed

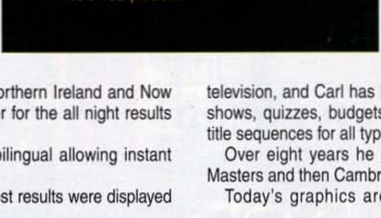
DemRh	13,629	Livsey
Llaf	10,761	Mann
Ceid	8,575	Evans
PC	3,768	Tudor
G'rdd	0	Richards

Mwyafrif 2,868 (+2.812)
71.0% wedi pleidleisio

Now Motion's Carl Blundell worked on the 1987 general election and 1989 local elections in Northern Ireland and Now Motion won the BBC Wales' tender for the all night results for the 651 UK constituencies.

All scripts and databases are bilingual allowing instant toggling from English to Welsh.

Using an Archimedes, all the latest results were displayed as headlines on a strip at the bottom of the TV screen, which also carried information such as the latest prediction or the current state of the parties. Added to which a small map appeared on a strip to show which region the result had come from.



There were five separate graphics for each constituency : The candidates, the full result, share of vote, change in vote and a single page summary including a mini-swingometer to represent the main changes.

At the seven regional levels the state of the parties, changes and share were all shown with an analysis including party performance through the regions, distribution of seats in map form, regional voting trends and so on.

What had been designated as the 97 Labour targets were dealt with in detail, and there was a summary of the key marginals in Wales and Scotland.

As no election night is complete without predictions, these were also built in.

Now Motion specialises in providing real-time graphics for television, and Carl has been producing software for game shows, quizzes, budgets as well as props for drama and title sequences for all types of programmes.

Over eight years he has used BBC Bs, moving on to Masters and then Cambridge 32016 workstations.

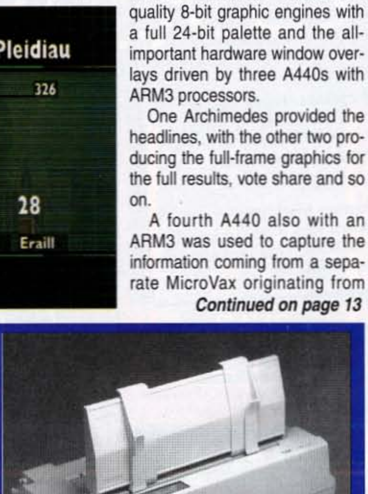
Today's graphics are produced using the Millipede Prisma 3 boards – broadcast quality 8-bit graphic engines with a full 24-bit palette and the all-important hardware window overlays driven by three A440s with ARM3 processors.

One Archimedes provided the headlines, with the other two producing the full-frame graphics for the full results, vote share and so on.

A fourth A440 also with an ARM3 was used to capture the information coming from a separate MicroVax originating from

Continued on page 13

Hard working and wearing



PRINTERS can be found in all sorts of environments, and Star's (0494 471111) latest sparkle, the VS-12, is a rugged 9-pin dot matrix slip printer designed to work in a wide variety of locations from hotel receptions or warehouses and factory floors.

The design enables it to withstand temperatures from -10 to +60 degrees at 10 to 80 per cent humidity with continuous vibration while still producing good printed documents.

The VS-12 provides 216 cps in draft mode and 54 cps in NLQ mode and it has a friction/push feed with industrial grip rollers to ensure perfect paper registration on multi-part stationary.

There is paper parking, first and last line printing with short form tear off and drop feed slip invoice printing. All for £649 for the AC version and £749 for the DC one.

Driving a hard bargain

DT SOFTWARE (0223 841099) have just launched their own range of IDE hard disc drives and interfaces for the Acorn 32 bit range.

The interface card provides a 16-bit 2-cycle MEMC interface to give a top data transfer rate of 8Mb/sec and supports up to four hard disc drives.

The drives are manufactured by Seagate, Conner and Quantum and start at £199.95 (including VAT) for an internal 44Mb drive and interface, up to £999.95 for an external 425Mb drive and interface.

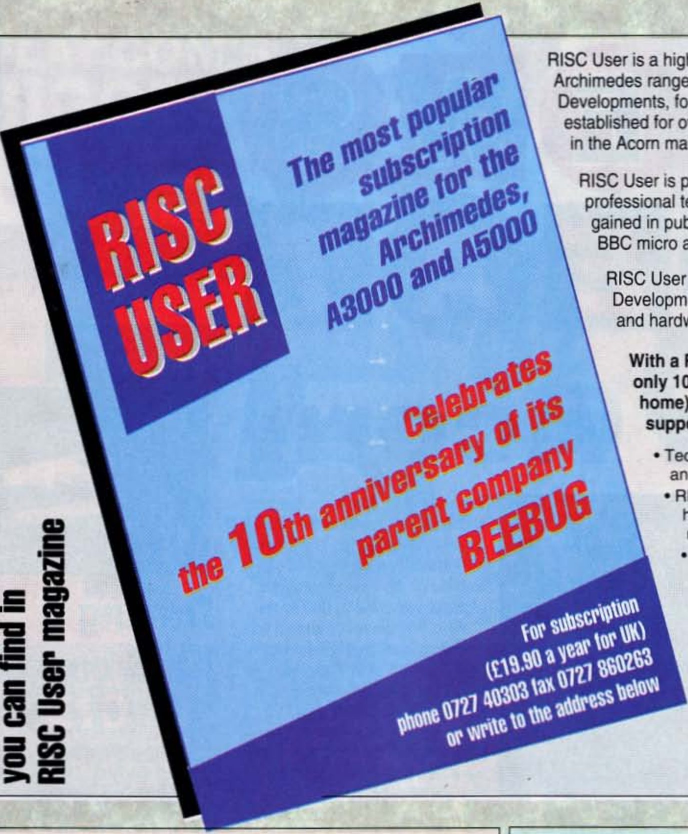
You can opt between internal mounting for the A300 and A400 series and external systems for the A3000s which houses the drive in a custom-designed case with its own PSU to reduce the load on the computer.

Cumana (0483 503121) have launched two new combined hard drive and SCSI card units for the BBC A3000. Aimed primarily at the education market, the 40Mb version costs £299 with the 80Mb version retailing for £449.

Both drives have a 16-bit SCSI card which will link the BBC A3000 with most SCSI devices such as CD Roms, and Acorn's CDFS is included as standard in the SCSI interface firmware. In addition there is also a utility for managing SCSI peripherals.

Cumana have opted for the SCSI rather than IDE technology as they believe it offers greater flexibility and expansion possibilities. IDE technology restricts cable lengths to between 30 and 60 cm, while SCSI systems cater for lengths up to 6 metres.

**Everything you want to know about your Archimedes..
you can find in
RISC User magazine**


RISC USER
The most popular subscription magazine for the Archimedes, A3000 and A5000
Celebrates the 10th anniversary of its parent company BEEBUG
For subscription (£19.90 a year for UK) phone 0727 40303 fax 0727 860263 or write to the address below

RISC User is a high quality magazine devoted totally to the Archimedes range of computers. It is published by RISC Developments, formed last year from BEEBUG, which has been established for over ten years as one of the foremost companies in the Acorn market.

RISC User is produced by a dedicated and enthusiastic professional team which benefits from10 years of experience gained in publishing the popular BEEBUG magazine for the BBC micro and the Master 128.

RISC User can also call upon BEEBUG's (now RISC Development's) considerable expertise as a major software and hardware developer for the Archimedes range.

With a RISC User subscription you will receive not only 10 magazines a year (delivered free to your home), but you will benefit from all the help and support a professional organisation can provide:

- Technical help with all RISC Developments' products and publications
- RISC Developments' own range of high quality hardware and software with special discounts for magazine subscribers
- Showroom with friendly professional staff, where you can try out the latest software and hardware
- Retail catalogue, mailed free to magazine subscribers, with regular updates on new products
- Tele-sales operation, where you can get technical guidance about your software or hardware requirements
- Speedy mail-order service
- Trade-in service to upgrade your equipment
- Workshop repairs by qualified staff

ChartWell

A sophisticated graph and chart package

ChartWell offers **24 different graph types**:
horizontal and vertical bar charts
line graphs
scatter charts
polar plots and pie charts.

Complete user control over:
choice of colour,
data point styles,
bar widths and spacing,
use of titles and labels,
legends to provide a key,
graduated/shaded backgrounds,
scales and tick marks, etc.

Acorn User

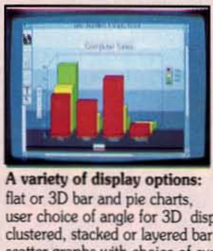
...ChartWell: simple but effective.

ChartWell scores on simpler controls over the basic graph types. It also has enough effects to present material prettily at a price that makes it attractive to the home or school user.

...All the options chosen can be saved in a 'Style Sheet file which makes it remarkably easy to create the same type of graph again...

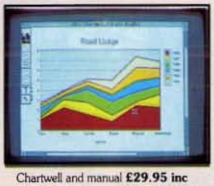
Archive

...This program from RISC Developments uses a really clever approach exploiting the desktop philosophy to the full.



Data can be imported from other applications, such as spreadsheets, databases, or created with a suitable editor as a text file.
Output is in standard Draw format.
Use of **'style sheets'** allows a set of options to be saved with data for future reference.

A variety of display options:
flat or 3D bar and pie charts,
user choice of angle for 3D display,
clustered, stacked or layered bar charts,
scatter graphs with choice of curve fitting techniques, regression lines and correlation coefficients, and use of error bars,
line graphs with choice of normal, cumulative area or stacked area displays.



Chartwell and manual **£29.95 inc** +2.00 p&p Code **PCHWa**

PolyGlot

A foreign language character generator

Archimedes World

...PolyGlot is a helpmate for wordprocessor and DTP software...which lets you choose from a European language character set rather than plain old English ASCII.

Typing into a document is very simple and the character appears at the cursor position when you click on it...

...The documentation is pretty good and a full explanation is given for the more technical areas.

... a vital add-on for a text editor, wordprocessor or a DTP program. Since schools and businesses are more and more in need of a foreign language capability, than this is a timely utility for the Archimedes.

PolyGlot is Fully Customisable

- Tailor the application to your own specific requirements and include only the languages and characters, which you actually need.
- Use PolyGlot as a simple way of selecting from any set of characters, i.e. currency signs or other symbols.
- Customise PolyGlot to use any of the available alphabets within your Archimedes (for this you must have suitable outline fonts or printers which support alphabets other than the standard Latin1).
- Ideal for education where the package can be readily tailored to suit the needs of individuals and classes.

Open a window for any specified language, and this will display all characters which are impossible or difficult to obtain from the keyboard: for example, accented characters in French,or umlauted characters in German. Select any of these characters with the mouse and it will automatically be inserted into your document.

Why PolyGlot is better than any other system

- Characters are displayed in both upper and lower case
- No need to set your keyboard to a foreign standard to obtain foreign characters.
- Use different languages or alternative character sets simultaneously.
- Use any character set, any alphabet and even scientific characters (provided your fonts support these).
- Comprehensive printing support.

PolyGlot and manual
Price **£19.95** inc + £2.00p&p
Code **PGLTb**

RISC Developments & BEEBUG Ltd. 117 Hatfield Road, St Albans, Herts, AL1 4JS. Tel. 0727 40303 Fax 0727 860263

Aviator will keep you flying

Make way for Intruder

For the birds

DEDICATED aviators, whether simulator or shoot-'em-up fans, should take a look at the new Quickshot joystick, Aviator. The Quickshot range is distributed by Bondwell (081-365 1993) with the Aviator retailing for £34.99.

Archimedes users can access this yoke-style unit via a switched joystick interface. The Aviator's easy-to-grip handles and controls feature altitude and level indicators as well as frame-by-frame slow motion capabilities, four positive response fire buttons and two dual-speed turbo fire selectors.

If this smacks of overkill you could opt for the £29.95 Intruder. Again used via a third-party interface, you'll have dual fire buttons, and two-speed turbo fire control at your disposal. The unusual design has an extra large joystick base with an easy-to-grip handle and strong suction pads to keep the Intruder in one place.

Programmers speak out

A NEW disc-based magazine is about to the launched by new software house Coin-Age (0282 692688) called Power to the Programmers.

Experienced and novice programmers will be encouraged to use this media to learn the secrets and tricks of the trade as well as the latest Archimedes developments.

Coin-Age want to hear from all programmers, artists and musicians, as well as anyone with news, views, questions and problems. This could be your chance to influence future Archimedes games.

The first issue of Power to the Programmers is available in May. To get a copy send £1 to cover disc, postage and duplication to: Power to the Programmers, Coinage, 1st Floor, 23 Cooper Street, Nelson, Lancashire BB9 7XW.

Music masterclass

DO YOU long to find your way around the intricacies of Studio 24+? Then Club A3000 and EMR could help you. They are organised a tutorial day at Mill Hill School, The Ridgeway, London NW7 1QS on May 17.

Mike Beecher will be taking the class and though concentrating on Studio 24+, he'll be there to help with other EMR software too.

The session starts and 10am and should finish around 4pm and the whole day – including lunch and refreshments – costs £20 and places are limited, though there are family discounts. Full details from Mick Cooper on 0705 371018.

Visionary merger

Peter Wild (left) and Charles Moir

COMPUTER Concepts (0442 63933) have acquired a majority stake in Newcastle-based hardware developers Wild Vision (091-519 1455).

The manufacturing facilities and hardware design of Tyne & Wear-based Wild Vision has been utilised by Computer Concepts' expansion cards for some time now. Both companies see this move as positioning them in the forefront of the multi-media boom. Computer Concepts' MD, Charles Moir said: "To produce the finest quality hardware and software we must recognise the increasing interdependence between the two areas."

Peter Wild, MD of Wild Vision commented: "I believe that this turn of events will prove to be catalytic in giving Wild Vision's desktop video products a considerable step-up in the multimedia arena as a whole."

Although the companies will be joining forces on selected ventures, it is intended that Wild Vision will retain its identity in day-to-day business.

From page 11

the central election unit at the BBC in London.

In the wings was an old A310 to give operators and producers scrolling data of the last 40 results which was additionally used by the radio studios.

A sixth machine – another A310 – acted as slave providing information for the presenters about which graphics were coming up next.

On the software side, Now Motion use their own customised package which creates the bars for bar charts and the like. Fonts are created and text generated through their complete font sub-system for the Prisma 3 called !Pfonts. This includes fully automatic kerning and a versatile layout editor for editing tab positions and text grids.

The graphics programs are all fully multi-tasking, with more than 70 per-cent taken up with the operator interface. The main element here is called the graphic stack which is where full-frame graphics are dropped, allowing the presenter to see the graphics coming up and take them from the bottom of the stack as he talks about them. Some graphics can be prepared in advance, and the database allows searches for candidates names, parties and so on or the linking of searches at will.

For the election a custom page description language was developed from scratch to allow the contents and animations of each graphic to be edited easily.

This can change fonts, layouts, bar chart dimensions, animation speeds and body text as was as including simple conditional subroutine handling, loops and data input.

The long ARM of the Risc

THE newest member of the Arm Risc processor family is now available from ARM – Advanced Risc Machines (0223 813000). The Arm 610 is a 32-bit microprocessor designed for embedded control and portables.

This chip runs at up to 15 million instructions per second with a 20MHz clock. A typical 486 that you would find in an IBM compatible PC runs at 16MIPS with a 33MHz clock which works out at about 50 per cent slower than the Arm 610.

Improved emulation

PC SOFTWARE users should look out for version 1.8 of the Acorn PC Emulator which incorporates support for VGA graphics and expanded memory. The price stays at £99 and there is a special upgrade price available, but this doesn't include the CD Rom extensions or MSdos disc.

Although this still uses MSdos 3.3 – the A5000 PC Emulator uses DRdos 5 – it has a revised manual and MSdos CD rom extensions.

You can configure the emulator to use VGA support which is particularly useful for people using CDRoms as many more will now be accessible to them.

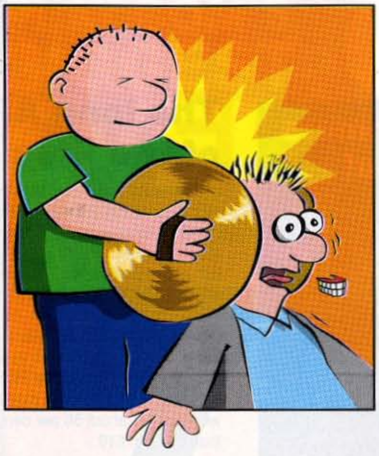
Top flight computers

MANCHESTER University's Department of Engineering (061 275 4444) are using an Archimedes to teach flight mechanics. The full details were presented by Dr Neil Stevenson at the Use of Computers in Engineering Education international conference held recently in Nottingham.

The Engineering Department use the Archimedes as flight simulators, allowing their undergraduate students to *fly* aircraft using exercises similar to the ones expected on a flight test.

The simulation results enable student to explore the stability of a range of aircraft types from a Cessna to a Jumbo. They can change 16 parameters to see how they affect an aircraft's response to such variables as sinusoidal gust loading and structural oscillations.

Why choose the Archimedes? Dr Stevenson commented on its speed and ease of use, adding that it was designed with graphics in mind.



COMPOSE YOURSELF!

Last week, Miss Brown was in a tangle. Her music class wasn't prepared in time. One group wanted to play the drums, but the music budget barely stretches to a tambourine. Another wanted to write its own music, but it all got rather messy. In the end, she got them all to sing a round song.

This week, Miss Brown is using *Notate*. Now composing music is easy — notes, rests etc. can be placed directly on the screen. Then the music can be played back immediately, and changes made to rhythm, tempo or pitch. When it's done, they're going to print out their piece — a nice neat copy for every musician in the class.

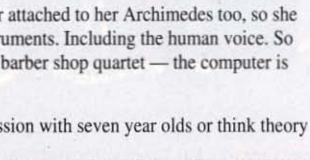
Next week Miss Brown is going to introduce 'Music of the World'. African rhythms, marches, rap, pentatonic scales — *Notate* can do the lot. It's even simple to move individual parts between tunes — ever heard the National anthem with a reggae percussion section?

Notate uses the standard Archimedes 'voices'. The computer can sound like anything from a cow bell to a trombone, from a melodic tom-tom to a hand clap. And up to eight of these 'instruments' can be played at once.

Miss Brown has a sound sampler attached to her Archimedes too, so she can record more of her own instruments. Including the human voice. So now three students are singing a barber shop quartet — the computer is humming the fourth part.

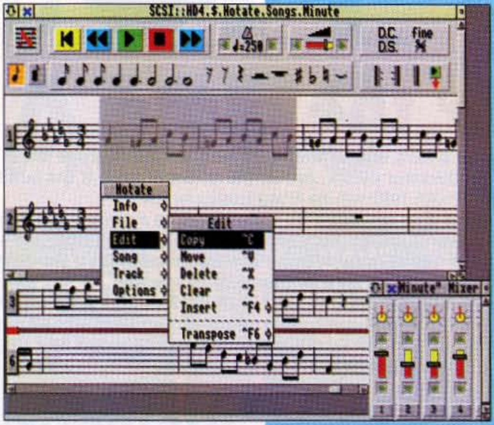
Whether you want to play percussion with seven year olds or think theory with seventeen year olds,

compose yourself —
with *Notate*.



Notate

DESIGNED IN THE CLASSROOM
FOR MUSICAL EDUCATION



Notate offers the following features:

- Comprehensive support materials in the manual and on disk
- Up to eight individual staves
- A wide range of synthesised and sampled sounds
- Ability to use accidentals and repeats
- Full range of time and key signatures with control over tempo and volume
- Automatic checking of note length relative to the bar space remaining
- Easy-to-use tape recorder style control panel
- Chord facility
- Mixer controls to adjust stereo balance and volume of all tracks
- Configurable for different levels of musical skill
- Editing facilities which, like word processing, include cut, copy, move and delete within bars, staves or between compositions
- Up to four compositions editable simultaneously
- Ability to transpose single parts or whole compositions
- Export and import of MIDI format 1 files
- Ability to play via MIDI where a suitable interface is fitted.

Notate is available now, priced at £59.

A site licence for Notate costs £190 for a primary school and £330 for a secondary school

LONGMAN
LOGOTRON

124 Cambridge Science Park
Milton Road
Cambridge CB4 4ZS

Tel. (0223) 425558
Fax (0223) 425349

Acorn Open Days

Acorn and dealers hold regular Open Days all over the country throughout the year. Look out for the ones in your area, it's your chance to talk to Acorn themselves as well as a selection of hardware and software manufacuters.

Check your local press for full details or contact your Acorn dealer directly.

Date	Town
Sat 9 May	Sheffield
Sun 10 May	Newport Pagnell
Sat 16 May	Cambridge
Sat 6 June	Norwich
Sun 7 June	Southend on Sea
Sat/ Sun 13-14 June	Belfast
Sat 20 June	Huddersfield
Sun 21 June	Liverpool
Sat 27 June	Isle of Wight
Sun 28 June	Bournemouth
Sat/Sun 12-13 Sept	Birmingham
Sat 19 Sept	Plymouth
Sun 20 Sept	Oxford
Sat 26 Sept	Blackpool
Sun 27 Sept	Oldham
Sat 3 Oct	Portsmouth
Sun 4 Oct	Bournemouth
Sat 10 Oct	Rotherham
Sun 11 Oct	St Helens
Sat 24 Oct	Swindon
Sun 25 Oct	Slough
Sat 31 Oct	Stoke on Trent
Sun 1 Nov	Sutton Coldfield
Sat 7 Nov	York
Sun 8 Nov	Northampton
Sat 14 Nov	Middlesborough
Sun 15 Nov	Hull
Sat 21 Nov	Watford
Sun 22 Nov	Luton
Sat 28 Nov	Bolton
Sun 29 Nov	Derby
Sat 12 Dec	Bradford
Sun 13 Dec	Leicester

The Micro User editors will be in attendance at the highlighted shows

Moving along

FLIGHT simulator experts Simis (0428 605833) are on the move in more ways than one. Having just completed the relocation of their offices to Headley House, Headley Road, Grayshott, Surrey GU26 6TU they are making quite an impression in the world of military aircraft.

Simis have just supplied the US Navy with a new simulator unit consisting of an A3000, colour monitor, Citizen Swift 24 printer, Morley I/O podule, Roland speakers, a remote monitor in series via a booster and a Sony 24in screen.

Running on this hardware via a custom joystick assembly provided by David Watts is a simulator of a T45 Goshawk.

This plane is similar to the British Hawk, but has been adapted by McDonald Douglas and British Aerospace for the US Navy who use it as a trainer on carriers.

The simulator goes through both standard and tricky procedures – taking off, flying, navigating a route and landing on an aircraft carrier, catching the hooks as you touch down.

It is based on an original exhibition model built for British Aerospace and featured the Tornado. If you want to try your hand you'll have to find at least £7,000.

Jet set floppies

BUYING discs over the next seven months could win you a trip to Paris, Rome or a magnificent holiday by Concorde and QE2 to New York.

Five million Verbatim Datalife floppy discs will be sold in the UK and each box will bear collectable tokens for bottles of wine, cinema tickets or vouchers for CDs, records and books. The double-entry competition comprises a jet-set visit to New York and a series of three life-brightening breaks for weary keyboard slaves.

Until June every box of the discs will bear a token – collect five for a £4 wine voucher, or enter the quiz to win five champagne breakfasts in Paris. If you prefer you can save your tokens and go for bigger and better prizes.

Keeping it clean

IT is the policy of this magazine not to accept advertisements which offer software containing pornography and scenes of excessive violence.

The train now leaving ...

ENTHUSIASTIC train spotters, users and builders should look out for Ashley Greenup Railway Simulations (0228 23557) with programs available for the Electron, BBC Micro and Risc OS.

Latest in this range is the Railfreight Operations Manager series. First to be launched is Cornish China Clay, £9.95. Your challenge is to organise rail freight activity in Cornwall, making sure that the china clay and Speedlink traffic moves smoothly, as English China Clay and Regional Control make demands on your pool of Class 37, 47 and Peak locomotives.

If you prefer rail traffic control, there is a range to choose from priced at £9.95. The last addition, Peterborough, features Electras, HSTs, Sprinters, Emus, Dmus and loco-hauled passenger and freight services.

Dublin debut

THE A5000 made its first appearance in the Republic of Ireland in March at the Computex Show in Dublin. Also on display was Acorn's electronic publishing package, a CD Rom system and Acorn Replay.

Updates and upgrades

THREE Silicon Vision (081-861 2173) products are now available in new versions. First off the starting blocks is Arc-PCB, which is now in version 1.7. The full package costs £195 although existing users can obtain an upgrade for £55 when they return their original discs.

Arc-PCB is an electronic printed circuit board designer which now boasts some features only previously available in Silicon Vision's professional range.

The package now has faster and improved automatic routing, oval and circular pads with fully variable sizes, a faster redraw, extended library part manipulation and instant editing operations.

Laser printers, ink jets, wide carriage printers – in fact the full range of Risc OS compatible printers – are supported via a new export to drawfile option. This also allows additional editing with packages such as Draw.

RiscBasic is now in its third release and is faster, more robust and easier to use than older versions. Additional Risc OS compliant features allow seamless operation between command-line compilation, icon-driven operation and the new windowed desktop developers environment.

This means that programmers can switch between interfaces without reconfiguring the compiler.

The DDE – Desktop Developer's Environment – has now also been produced for RiscBasic, allowing Basic program source textfiles developed in Edit to be compiled directly.

All you have to do is drag the textfile on to the RiscBasic icon and any syntax errors will be highlighted in the Edit window for total integration. You'll also find that the Twin and Basic Editors are directly supported by the DDE. RiscBasic is priced at £149.95 with upgrades starting at £30.

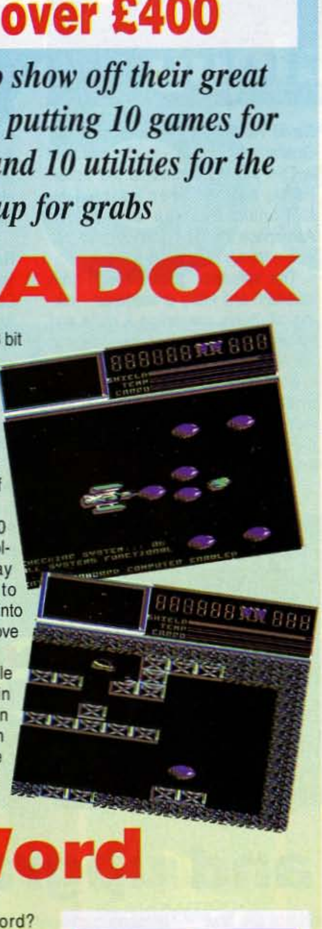
On the business side, ShareHolder enters version 2.03 for £195 or £35 as an upgrade. It now has more Risc OS compliant features and you can drag selected data to other fields as well as to and from the calculator. ShareHolder windows can also be dragged directly to a Risc OS printer driver.

FREEBIES

Worth over £400

TCA are eager to show off their great products and are putting 10 games for the BBC Micro and 10 utilities for the 32 bit machines up for grabs

PARADOX



THIS brand-new game for the 8 bit BBC Micro is a great combination of puzzle-solving and shoot-'em-up. Written by the author of the hit breakout-style game Hyperball, Paradox combines quick thinking and fast action to provide hours of fun.

Having been stranded 500 years in the past, you must collect fuel and fight your way through defence systems to escape via a black hole back into the future. But you can only move ten years at a time.

The ten copies are available on 40/80 5.25in DFS, 5.25in ADFS (worth £14.95) or on 3.5in Master Compact (worth £15.95) formats. Make sure you say which one you want when you claim your freebie.

KeyWord

Searching for the right word? KeyWord may have it, this multitasking, fully Risc OS-compliant utility is the electronic equivalent of a thesaurus.

With 10,000 synonyms available there's a good chance you'll find what you need. Just enter a word with a meaning similar to the one your looking for, select from the categories of meaning presented and choose the word you really mean.

Then you can drag the word directly from the KeyWord window into your wordprocessor or DTP package – it's as easy as that TCA have 10 copies of this excellent program worth £24.95, just waiting to be claimed.

What to do

The first 20 readers' names and addresses pulled out of the sack after May 31 will receive a FREE copy of either Paradox or KeyWord.

Just write to: **Micro User Freebie Offer (May), The Micro User, Europress Publications, Adlington Park, Macclesfield, SK10 4NP.** Make sure you specify which product you would like to receive and, in the case of Paradox, which format.

As clear as mud

THE closure of Micronet left some modem games players bereft. However, Avatar I – The Tower – a new multi-user roleplaying fantasy games developed by Microgame (081-841 2788) for Silicon Village (0992 586919) – promises to rectify this.

MUDs – multi-user dungeons – have been popular for some years now, but Vick Curshen's Avatar brings together TSR's Dungeons and Dragons style and the on-line multi-user excitement of the original MUD and MUDII.

Avatar runs on an Archimedes 440 with ARM 3 and 4Mb of ram. At present it uses nine serial ports, but is about to be converted to use an Ethernet/TCP-IP which will link it to the host network.

A special multi-tasking engine was written using RiscAssembler and a top level of compiled Basic interprets the game mechanics and navigates the inventory and dictionary databases.

A sophisticated command parser has been designed with a codeless puzzle generator to complete the system. Silicon Villagers have been playing the game since December, but March saw the commercial launch of the game and Microgames viewdata gateway which allows Villagers to access Avatar without having to change protocol.

If you want to try it, there's free access to a Silicon Village and Avatar demonstration service. Simply dial 081-759 6996 (multispeed) and set your communications software to viewdata and log-in using customer identity 4444444444 and password 4444.

So what does the world Avatar offer? You are a godling on the plane of Lomah, a manufactured world for the baby gods complete with nursery, school and college.

You grow up by activating and developing six avatars – wisdom, dexterity, strength and so on – and on your arrival in Lomah the Guildmaster sets you a challenge.

Provided with weapons, armour, potions and other weird and wonderful items, the rest is up to you.

Talking about typing

TURBO-Type from CIS (071-833 4023) has been undergoing further developments since its initial release. Now in version 1.05, the enhancements have been introduced to help sight-impaired users.

There is now a facility to alter the colours on the user screen, to set the colour for the print and for the background.

A competition option may be useful to schools. With it you can specify up to four users. Individual users can re-set their scores or remove their names. Results can be shown in a comparative line graph.

Show stopper

THE A5000 stepped out in all its glory at the official opening of the London Canal Museum when the Princess Royal, Princess Anne, saw Sam Wauchope and Brian Salter putting the new Acorn power-house through its paces.

Printing on your lap

KODAK (0442 61122) have launched a new compact inkjet printer. The Diconix 701 includes near laser quality with 300 dpi output as well as a convenient built-in cut sheet feeder.

The sheet feed is not separate and so takes up less desk space. The printer is designed to be portable and can run from battery or mains. It costs £429 and weighs less than 6lb.

ESSENTIAL READING MATERIAL FOR THE ACORN ARCHIMEDES *from* DABS PRESS

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Offices: 22 Warwick St, Prestwich, Manchester M25 7HN. Tel: 061-773 8632. Fax: 061-773 8290. Proprietor: David Atherton. All prices include VAT (0% on books), and UK postage. Access/Visa accepted. Foreign add £2.50 surface, £12 air.

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NEW
A Dabhand Guide
BUDGET DTP
ON THE ACORN ARCHIMEDES
ROGER AMOS
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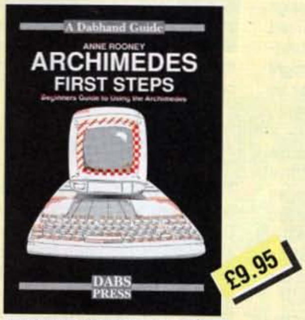
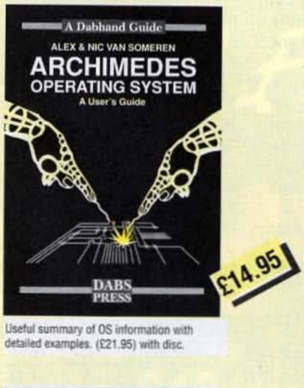
£12.95

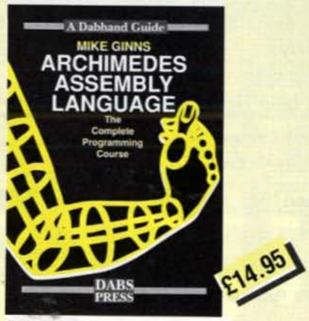
An invaluable guide to the free software on your Archimedes, and how to get the best desktop publishing results for very little cost.



Introductory book for the Arc, covering the basic operations and use of !Edit, !Draw, etc.



Useful summary of OS information with detailed examples. (£21.95) with disc.



The only tutorial and reference on ARM assembler on the market, with many RISC OS examples. (£21.95 with disc.)

BBC SOFTWARE

Hyperdriver
The ultimate printer driver ROM, with over 80 commands, a built-in NLQ character set, WYSIWIG previewing, access from View, Wordwise, Interword or BASIC. 100 page manual. For B/B+/E/M/C. Price £29.95 ROM, £24.95 disc for SRAM.

Minidriver
As HyperDriver but for Mini Office II. Includes Viewdata terminal. £24.95 ROM. SRAM version £19.95.

Mos Plus
Utility ROM for Master 128s only fixing EDIT and CLOSE#0 bugs, ADFS format, verify and backup in ROM, backup/compacting in SRAM, alarm clock and configurable startup facility and much more. Price £12.95 ROM, £7.95 SRAM.

Sidewriter
Pop-up notepad for SRAM users (any SRAM machine), works with any software. Price £7.95.

Assembler Bundle
Two Bruce Smith books on 6502 assembler with discs and Master Series update booklet. For B/B+/E/M/C/ RRP over £30, yours for £4.95!

Fingerprint
SRAM or main memory 6502 machine code monitor/disassembler/memory editor. For B/B+/E/M/C/ Price £9.95.

Conversion Kit
Ready-made 6502 assembler routines, for learning or development. Price £7.95

BBC BOOKS

View Dabhand Guide
Bruce Smith's comprehensive guide to View wordprocessor. 'For those who want a complete thorough and readable guide to View, then Bruce Smith is your man' (Beebug). £12.95 or £17.95 with disc.

Master Operating System
David Atherton's definitive reference work including the famous 'differences between all eight-bit models' section used by countless programmers to ensure compatibility across the full eight-bit range. £12.95 or £17.95 with disc.

Mini Office II Guide
Detailed tutorial by Bruce Smith and Robin Burton for the BBC/Master versions of the software. Price £9.95 or £14.95 with disc.

Mastering Interpreters and Compilers
Fascinating Bruce Smith title on creating high level languages. £14.95 with free disc.

MASTER 512

Master 512 User Guide
Full instruction for using the 512 and DOS Plus, with tips on software compatibility. £9.95 or £14.95 with disc.

Master 512 Technical Guide
The companion guide with full 512 programming information and hardware expansion projects. Price £14.95 or £19.95 with disc.

Master 512 Shareware Collections
Two collections of PC shareware, all tried and tested on the 512. Includes WP's, spreadsheets, databases, games etc. Five full 800k discs in each. Each collection normally £29.95, special offer £25 for both.

ARCHIMEDES SOFTWARE

Instigator
Utility system providing disc sector editor, memory editor, disassembler, command line archiving, and much more. Price £49.95

Arc PC Emulator Shareware
Similar to Master 512 Shareware but for the Arc PC Emulator. Two collections of five discs each. Normal Price £34.95. Now on special offer, both collections for £25.

ARCDFS
Very popular program to provide full DFS facilities on desktop or !65Host/!65Tube. Price £29.95

ARCHIMEDES/BBC BOOKS

Basic V Guide
BASIC V guide covering differences between earlier BBC BASICs and the superior version for the Archimedes. £9.95

C: A Dabhand Guide
Massive 512-page complete guide to C programming. No previous experience required. Arc & BBC sections £14.95 or £21.95 with disc.

OTHER BOOKS

Z88: A Dabhand Guide
Introduction to the Z88, by the designers of the machines own software. £14.95

Z88 Pipedream Guide
John Allen's detailed work on all aspects of Z88 PipeDream. Good explanations of printing. Price £14.95

Psion LZ OPL Guide
Ian Sinclair's guide to OPL programming on the LZ series of Organiser machines. £12.95

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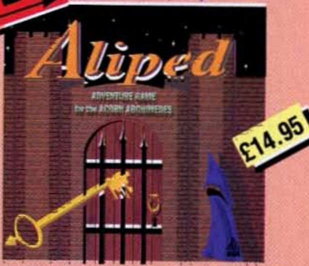
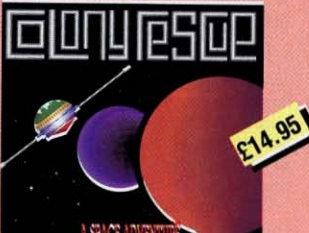
NEW

Games Action



'Aliped - wing footed like a bat is the spell that has been put on you by the evil step-mother of your fair princess Natasha'.
Smooth multi-directional scrolling castle, stunning use of stereo sound, high quality graphics. Needs 1MB. RISC OS compatible.



The date is 2143 A.D., the universe has started to contract, causing the most inner galaxies' fine balance to be upset. Their only chance is you in your humble rescue ship.
Multi level game with high quality graphics. Needs 1MB. RISC OS compatible.

STARCH
£14.95
Archimedes Action Game

'Harry and Dave manage the laundry firm, but things have been going wrong. They work all night but will they put things right?'
Multi level game, high quality graphics, simple key controls for easy movement of characters. Needs 1MB. RISC OS compatible.

MORE ARC GAMES

ALERION
Classic shoot-'em-up scroller. Multi-level, RISC OS compatible. Not protected. £14.95.

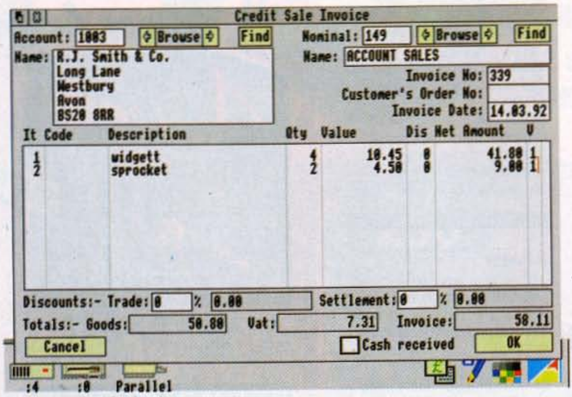
ARCENDIUM
Draughts, Backgammon, Reversi and Quadline, now RISC OS compatible. £14.95.

ALIEN INVASION
Classic Space Invaders with editable invaders, waves etc. £14.95

ALL-IN BOXING
Realistic boxing game with digitised sound etc. 1 or 2 player. £14.95.

In the counting house

Clem Vogel audits two ways of dealing with professional accounts



Credit Sale Invoice

Account: 1003
Name: R.J. Smith & Co.
Long Lane
Westbury
Avon
BS20 8RR

Nominal: 149
Name: ACCOUNT SALES
Invoice No: 339
Customer's Order No:
Invoice Date: 14.03.92

It	Code	Description	Qty	Value	Dis	Net Amount	V
1		widgett	4	10.45	0	41.80	1
2		sprocket	2	4.50	0	9.00	1

Discounts:- Trade: 0 % 0.00 Settlement: 0 % 0.00
Totals:- Goods: 50.80 Vat: 7.31 Invoice: 58.11
☐ Cash received

Micro-Trader's sales invoice

DO YOU run a small business or look after the accounts of a club? Do you spend your midnight hours perched on a high stool inscribing neat double entry columns of red and black ink in a dusty leather-bound ledger?

Or do you chuck every invoice, receipt, cheque stub, final demand and bankruptcy petition into an old cornflakes box and pack the lot off annually to the accountant?

If the former, you could use an accounts package to release time for more agreeable late-evening pursuits. If the latter, you definitely need an accounts package to stop your accountant charging lots of money for doing work which is far too routine to merit his professional and costly attention.

Micro-Trader Business System

THIS modular, integrated business accounts system from Pres consists of Sales, Purchase and Nominal Ledger modules together with Stock Control and Mailing modules – a Payroll module is under development and the modules may be bought separately or together. It is a development of the successful Micro-Trader from Meadow Computers issued in 1984 for the BBC Micro. This Archimedes version has been extensively rewritten in C to make use of the Archimedes wimp environment and greater memory. In particular, it is the only Archimedes accounts package that is fully multi-tasking.

You can run the different modules simultaneously in different windows and multitask within a module if you want to do several operations together.

The system requirements are modest: You can run the complete system with around 700 accounts from a single floppy, so no disc swapping is needed and 1Mb of memory is sufficient. If you use a hard disc you can have 100,000 stock lines and seemingly limitless numbers of accounts – as well as much more rapid data access.

Which modules you need depends, of course, on what you are trying to achieve. A small business which doesn't trade with accounts customers or suppliers could manage with just the Nominal Ledger.

This would also suit a service supplier like a landlord who receives rents on a regular basis, but doesn't invoice his tenants, though unfortunately there is no provision for automatic periodic entry of recurring amounts.

With the nominal ledger you assign every transaction to a pre-defined account, sometimes called a cost-centre. For example, expenses might be assigned to one of a dozen or so cost-centres called postage, travel, wages, rent and so on.

The system will conduct full double entry bookkeeping so that a payment to an employee credits the wages account and simultaneously debits the relevant bank account. If VAT is involved, the proportion relating thereto is credited or debited to the appropriate VAT account.

If you make sales to account customers you will need the Sales Ledger. This will also raise and print invoices, credit notes, statements and delivery advices. There are facilities for setting credit limits, discounts and settlement terms.

If the Stock Control module is present, the stock item details will appear automatically when the stock number is entered. The invoice layout can be edited so that you can, for example, leave plenty of space for descriptions if your business requires this.

Editing layouts in Micro-Trader requires you to rewrite the layout code and not everyone will feel able to do this, so Pres provide customised layouts for £20 per form.

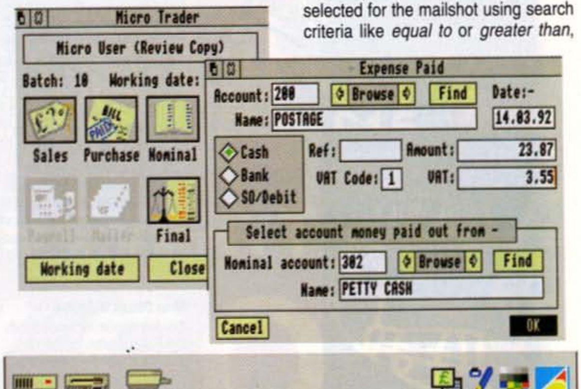
The Purchase Ledger is for purchases on account. Invoices are entered in the appropriate account and can be paid immediately or held over for batch payment. A remittance advice can be printed if desired and if the Nominal ledger module is present the relevant cash or bank account will be simultaneously debited.

Stock Control

The Stock Control module stores descriptions and prices of stock lines. Descriptions of up to 24 characters are allowed together with a user-defined stock reference of up to 14 characters with department and product-type codes. All these codes can be searched and sorted and a range of reports can be produced for things like turnover and re-order levels.

If you need to send mailshots to names stored on the Sales or Purchase Ledgers you can use the Mailer module. This allows letters to be prepared on all popular wordprocessors with importation fields to include any information from the accounts. So when a letter is printed you have the option to print a label or envelope.

Groups of accounts can be selected for the mailshot using search criteria like *equal to* or *greater than*,

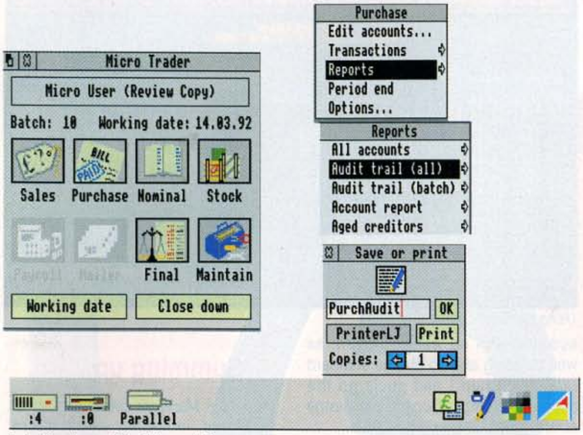


Micro User (Review Copy)
Batch: 10 Working date:

Expense Paid

Account: 200
Name: POSTAGE
Date:- 14.03.92
● Cash
○ Bank
○ SO/Debit
Ref:
Amount: 23.87
VAT Code: 1
VAT: 3.55
Select account money paid out from -
Nominal account: 302
Name: PETTY CASH

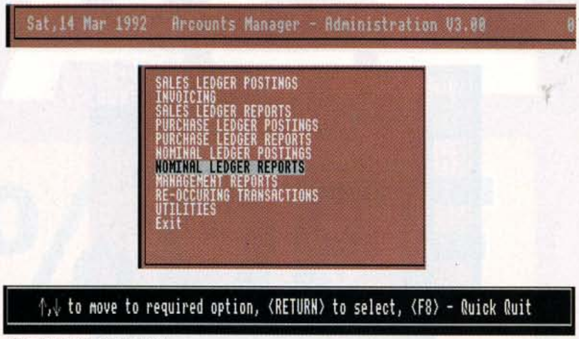
Entering a transaction in Micro-Trader's Purchase Ledger



Micro User (Review Copy)

Batch: 10 Working date: 14.03.92

Selecting the audit trail through the menus



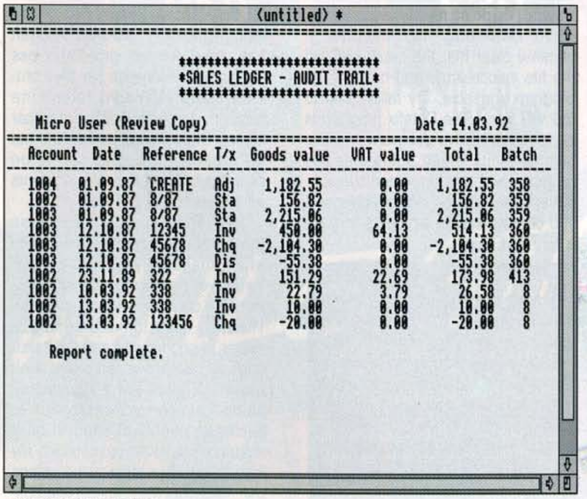
```
Sat,14 Mar 1992   Arcounts Manager - Administration V3.00

SALES LEDGER POSTINGS
INVOICING
SALES LEDGER REPORTS
PURCHASE LEDGER POSTINGS
PURCHASE LEDGER REPORTS
NOMINAL LEDGER POSTINGS
NOMINAL LEDGER REPORTS
MANAGEMENT REPORTS
RE-OCCURING TRANSACTIONS
UTILITIES
Exit

↑,↓ to move to required option, <RETURN> to select, <F8> - Quick Quit
```

The Arcounts main menu

applied to any field in the account, including current balance and aged debts. So prompt payers can be sent their Christmas hampers and defaulters offers they can't refuse, depending on whether you adopt the stick or the carrot as your corporate ethos.



```
                 ****************************
                 *SALES LEDGER - AUDIT TRAIL*
                 ****************************

 Micro User (Review Copy)                           Date 14.03.92
=====================================================================
 Account  Date    Reference T/x  Goods value   VAT value    Total  Batch
---------------------------------------------------------------------
 1004    01.09.87  CREATE   Adj     1,182.55        0.00   1,182.55  358
 1002    01.09.87  8/87     Sta       156.82        0.00     156.82  359
 1003    01.09.87  8/87     Sta     2,215.06        0.00   2,215.06  359
 1003    12.10.87  12345    Inv       450.00       64.13     514.13  360
 1003    12.10.87  45678    Chq    -2,104.30        0.00  -2,104.30  360
 1003    12.10.87  45678    Dis       -55.38        0.00     -55.38  360
 1002    23.11.89  322      Inv       151.29       22.69     173.98  413
 1002    10.03.92  338      Inv        22.79        3.79      26.58    8
 1002    13.03.92  338      Inv        10.00        0.00      10.00    8
 1002    13.03.92  123456   Chq       -20.00        0.00     -20.00    8

   Report complete.
```

Using the Sales Ledger

Taking short-cuts

Accounts software requires frequent, often repetitive data entry and it is easier to use if intelligent short-cuts are provided. Micro-Trader scores fairly well on this as it uses well thought-out hierarchical menus which allow you to arrive at your desired option with three or four mouse clicks.

The normal Risc OS control key short-cuts for deletion and so on, are supported, but are not referred to in the handbook. There are no function key short-cuts and no dragging of fields with the mouse, but it accepts truncated and case-altered names for fields like supplier or product, while insisting on full, case-dependent entries for codes such as a product code. This is a good arrangement ensuring fairly rapid and error-free data entry.

A find button will run through the options if the field name you have used fits more than one entry. Unedited fields contain default values where this is sensible and VAT, discounts and the like are calculated and entered automatically by the system without any tiresome requests.

A degree of relationship exists between the various database files around which the program is constructed, so that vacant fields can be automatically filled by importation from elsewhere. For example, entering the customer number in an invoice will import the customer's name and address from the customer database maintained in the Sales Ledger.

All reports are displayed on screen by dropping them into Edit and printed using Risc OS printer drivers. This has no disadvantages and keeps the code concise.

The philosophy behind Micro-Trader is to provide a simple user interface so that the system can be driven with a minimum of skill or experience. I have no doubt that this is the right approach, because few users are intrinsically interested in accounting – they have an irksome task which they want the computer to simplify for them. I think that Micro-Trader fulfils this need.

A way it does this is by limiting the features provided to the essential and highly desirable, while forgoing those which are either cosmetic or esoteric. You will not find multi-level sort facilities.

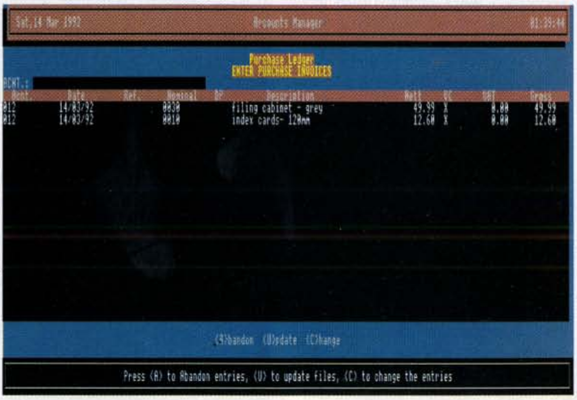
There are no foreign currency conversions as offered by Arcounts, and no actuarial analysis to provide return on capital or fixed asset ratios or graphical sales analyses. Neither is there a stock swap or stock reservation option, the essentials are there.

You can produce profit and loss and balance accounts, trial balances and audit trails – including audit trail by batch. You can handle different VAT rates – including defaulting to zero – so that you're not constantly entering zeros as some packages make you do, which is infuriating if you are not registered.

It also enables you to handle credits without the charade of issuing negative sum invoices. Stock write-offs, depreciation and capital allowances are also catered for. Most important of all, there is a journal facility for making corrections. Incidentally, my friendly tax inspector tells me that journal entries are the first thing they look at if they think you are cooking the books, so stick to verifiable changes.

There are not many weaknesses with this package, though there is no facility to perform banking reconciliations which is a serious omission. I'd like to see function key short-cuts and mouse drags, but things work smoothly enough without.

An option to include recurring transactions on a periodic basis would have been nice as would a mouse/cursor controlled forms



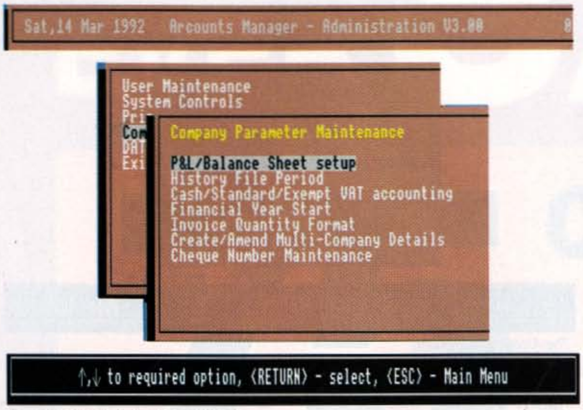
```
Sat,14 Mar 1992            Arcounts Manager                 01:39:44

                            Purchase Ledger
                        ENTER PURCHASE INVOICES
ACNT.:
 Acnt.    Date     Ref.   Nominal  DP   Description             Nett   VC   VAT   Gross
012     14/03/92          0030          filing cabinet - grey   49.99  X   0.00   49.99
012     14/03/92          0010          index cards- 120mm      12.60  X   0.00   12.60

                  (A)bandon  (U)pdate  (C)hange

Press (A) to Abandon entries, (U) to update files, (C) to change the entries
```

Entering purchase invoices in Arcounts


Sat,14 Mar 1992   Arcounts Manager - Administration V3.00
User Maintenance
System Controls
Pri
Com
DAT
Exi
Company Parameter Maintenance
P&L/Balance Sheet setup
History File Period
Cash/Standard/Exempt VAT accounting
Financial Year Start
Invoice Quantity Format
Create/Amend Multi-Company Details
Cheque Number Maintenance
↑,↓ to required option, <RETURN> - select, <ESC> - Main Menu

Accessing the maintenance submenu

designer for customising invoices, dispatch notes and so on. A weakness in the accounts reporting option means that the account selected is not the one you enter, but the one you last selected in the Edit Accounts option. Once you realise this it's no problem – you just display Edit Accounts in a separate window and select your report account there.

Arcounts Manager

Visionscan Software's package offers Sales, Purchase and Nominal Ledger with Stock Control and Payroll modules promised. The source code is written in Basic, but is compiled rather than interpreted, so the program runs quite fast, though it is not multitasking.

Arcounts has some good features but also some faults. There are two feeble handbooks – neither has an index – and one of them doesn't even have a contents with Menus listed in the User Guide not always corresponding to those on screen. There is a perilous lack of both clarity and detail in relation to several crucial operations.

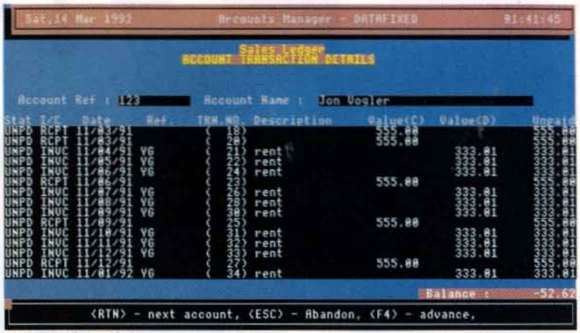
Function keys are used, but there is no key-strip supplied. This weakness is repeated in some of the form displays which need to be better commented. I waited for some minutes in front of an immobile screen which had not bothered to tell me that further progress depended on having a printer connected and some screens don't tell you how to exit.

Most menus accept upper or lower case, but one did not while one of the install screens didn't even clear text from the previous screen so I got an overlay of gobbledegook. Warning messages would flash on screen and disappear again before I had time to read them and printouts are not immune.

There is a potentially nice feature to print cheques, but it showed excessive concern for my financial state by only issuing cheques for £0.00. Although I had configured the software for my printer, it kept inserting columns of italic 3s in odd parts of cheques and statements.

However, Visionscan are having the handbooks rewritten as well as issuing a function key strip and they tell me that they are still making improvements to the program code.

I did find that I was able to enter a transaction into a non-existent bank-



```
Sat,14 Mar 1992          Arcounts Manager - DATAFIXED              01:41:45

                               Sales Ledger
                       ACCOUNT TRANSACTION DETAILS

  Account Ref : 123          Account Name :  Jon Vogler
Stat I/C   Date      Ref.  TRN.NO. Description    Value(C)  Value(D)    Unpai
UNPD RCPT 11/03/91          (  18)                  555.00               555.0
UNPD RCPT 11/03/91          (  20)                  555.00               555.0
UNPD INVC 11/04/91 VG       (  21) rent                       333.01     333.0
UNPD INVC 11/05/91 VG       (  22) rent                       333.01     333.0
UNPD INVC 11/06/91 VG       (  24) rent                       333.01     333.0
UNPD RCPT 11/06/91          (  23)                  555.00               555.0
UNPD INVC 11/07/91 VG       (  26) rent                       333.01     333.0
UNPD INVC 11/08/91 VG       (  28) rent                       333.01     333.0
UNPD INVC 11/09/91 VG       (  30) rent                       333.01     333.0
UNPD RCPT 11/09/91          (  25)                  555.00               555.0
UNPD INVC 11/10/91 VG       (  31) rent                       333.01     333.0
UNPD INVC 11/11/91 VG       (  32) rent                       333.01     333.0
UNPD INVC 11/12/91 VG       (  33) rent                       333.01     333.0
UNPD RCPT 11/12/91          (  27)                  555.00               555.0
UNPD INVC 11/01/92 VG       (  34) rent                       333.01     333.0
                                                          Balance :      -52.6
        <RTN> - next account, <ESC> - Abandon, <F4> - advance,
```

Using the Sales Ledger

account, with no warning given, as well as being able to charge standard rate VAT when I had declared the account exempt. Occasional penny errors appear in transactions too.

Editing forms is clumsy – you have to run through all the fields in a record to alter one. A catastrophe occurred when I posted a sales receipt and the program crashed with the bleak message: *Unable to open file:* Audit, Call Supervisor – if I had a supervisor, I wouldn't be doing my own accounts.

On rebooting the machine it became clear that the crash had left the file inaccessible and most of the program unusable. Try telling that to the VAT man! The Datafix program is supplied with the program – a file closing utility which uncrashes the program and lists unposted transactions to the printer – this works and you can correct the accounts through a Journal Entry.

What does accounts software do?

We need to distinguish accountancy from bookkeeping. Bookkeeping is the day-to-day task of keeping track of orders, payments, sales and purchases. These need to be entered under different headings so that you can keep the VATable sales separate from the VAT-free ones or show whether a payment was made by cheque, credit card or cash.

This used to be done by writing details into ledgers and the word is still used to describe the relevant computer files. These files need to be integrated, so that entering a payment to a supplier not only credits the supplier's account, it also debits the file for the bank account from which you made the payment.

Once transactions have been entered in the ledgers, the software can arrange for other things to happen: Invoices and credit notes can be raised, statements, despatch notes and address labels can be printed and reports can be assembled.

Reports are summaries of the account data presented in some convenient way. Commonly available reports are customer lists, aged debtor lists – showing outstanding balances by overdue category, one month, two months and so on – and Audit Trails showing condensed details of all transactions on file. Accountancy is the annual presentation of the ledger totals to show annual profit and loss together with a summary of assets and liabilities to create a balance sheet. It is concerned with presenting the totals in such a way that tax liability can be assessed, profits for shareholders computed and comparisons made with former years.

Most people are content to leave this to their accountant. What they require is a bookkeeping package for their day-to-day needs. However, if the software can produce a proper profit and loss account including provision for depreciation, stock losses and the like, it can be considered a full accountancy package.

Summing up

Arcounts Manager contains a lot of features, including an excellent option for posting recurring transactions. You could set monthly rent payments for example and they would be posted automatically every time the system clock advanced to a new month.

There was also a proper system for bank reconciliation and all the usual reporting features of audit trail, aged debtors, profit and loss and so on. Visionscan say they provide comprehensive telephone back-up. Arcounts is like a new car model: Strong on specification, but with teething troubles still to be sorted out. When they are, Arcounts will be worth a further look.

The Micro-Trader Business System has a smooth consistency which makes it pleasant to use. Two-level password security protects the confidentiality of your data. The data entry forms are masterpieces of good layout and the handbook is comprehensive and well written. Buyers get 30 days free product support with an option to purchase continual support on a modestly priced annual contract. My impression from phone discussions with Pres was that support line customers would find a quality back-up service when they needed it.

Product: Arcounts Manager
Price: £299
Product: Visionscan Software, 68 Stramongate, Kendal, Cumbria LA9 4BD.
Tel: 0539 722559

Product: Micro-Trader Business System
Price: £79.95 each module (Mailing £39.95)
Supplier: PRES, PO Box 319, Lightwater, Surrey GU18 5PW.
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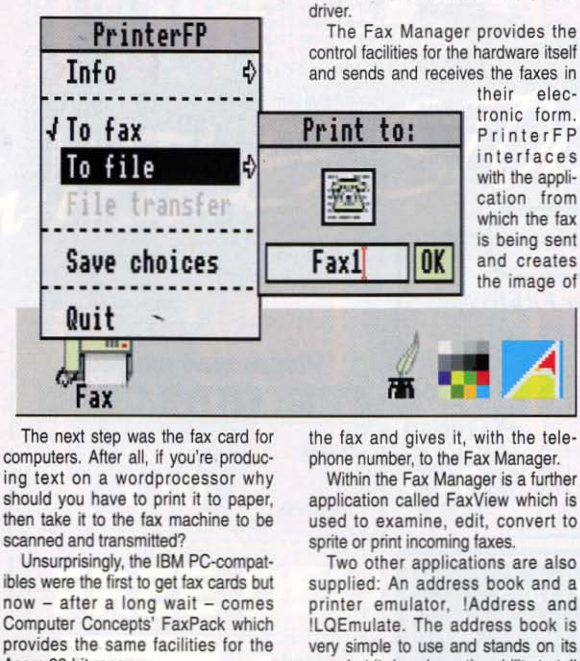
Hempstead, Herts HP2 6EX.
Tel: 0442 63933
Fax: 0442 231632

Steve Turnbull puts the working version of a fax card for the 32-bit Acorn machines through its paces

PERHAPS the biggest business revolution recently has been the fax machine with its ability to send visual images and written words by telephone.

Sending text alone is very useful – a direct conversation may be pleasant but the details are easily forgotten. With a fax you can put your thoughts down at your own speed and send it off, and the recipient has a permanent record of your communication.

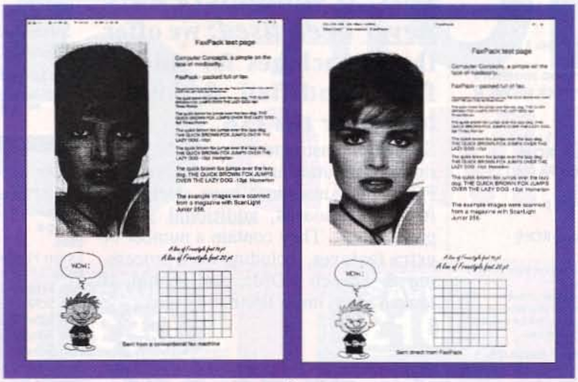
The advent of the Amstrad Fax put such devices within the range of individuals and very small businesses. There are very few companies and professionals who don't possess some form of fax machine.



The next step was the fax card for computers. After all, if you're producing text on a wordprocessor why should you have to print it to paper, then take it to the fax machine to be scanned and transmitted?

Unsurprisingly, the IBM PC-compatibles were the first to get fax cards but now – after a long wait – comes Computer Concepts' FaxPack which provides the same facilities for the Acorn 32-bit range.

The package comes in two parts. The hardware is a standard card that plugs inside the machine – if you have an A3000 you must use an expansion box. Fitting is not a problem.



The software is divided into two main parts: The Fax Manager – the controller, and PrinterFP – the printer driver.

The Fax Manager provides the control facilities for the hardware itself and sends and receives the faxes in their electronic form. PrinterFP interfaces with the application from which the fax is being sent and creates the image of the fax and gives it, with the telephone number, to the Fax Manager.

Within the Fax Manager is a further application called FaxView which is used to examine, edit, convert to sprite or print incoming faxes.

Two other applications are also supplied: An address book and a printer emulator, !Address and !LQEmulate. The address book is very simple to use and stands on its own, but it does have the ability to tell the FaxPack which phone number to use or to auto-dial a number.

There are two ways of connecting FaxPack to the telephone system. Most businesses will have a separate fax line and the software can be connected to it directly which allows automatic reception of faxes.

Alternatively you can use a telephone splitter and connect to your usual voice line. In this case you won't want to have the automatic reception switched on. Computer Concepts supply a line splitter in the package.

The manual is about 100 pages long, unfortunately several pages of it are no longer applicable or just plain wrong – an addendum is supplied and it's important to mark your manual with the changes first or you can spend time worrying that the hardware isn't installed correctly.

The reason for the manual's faults is that FaxPack was due for release quite a long time ago, and the manual was produced for this earlier version. Since then a large number of fairly major changes have taken place.

PrinterFP

The printer driver is installed exactly the same way as any other, and has a similar menu to most. There's no control over the paper size and you can only output to the fax card or to a file. If you have a saved fax file just drag it on to the Fax Manager to print.

Clicking Select on the PrinterFP icon brings up the expected setup window. At the top is a status message area and below that a destination area which shows the telephone number to be sent to plus a button which prevents automatic dialling when on.

Two buttons allow you to switch from Portrait to Landscape: If you have a file that's printing a Landscape page click on the printer driver's Landscape button to send it sideways, so it comes out properly on the target fax machine.

Each fax page can have standard text at the top and bottom. Within the fax setup you can control which outline font is used for this information. Also you could send a pure text file, in which case you need to set the *Normal text* font. You can't control the size of either of these.

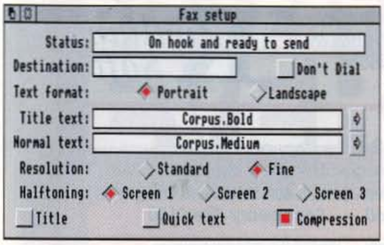
Fax machines currently have two levels of resolution, standard and fine. During the connection procedure the sending machine asks the receiver what resolution it can handle. You can opt to send at the lower resolution, or, if the target machine can handle it, the higher.

When sending sprites a particular type of screen is used to convert the image to black and white dots. FaxPack gives you three choices and generally you won't need to change from the default setting but certain images may require one of the other screens.

The *Title* button puts a title line containing page number, file, date and time on to every page of the fax. *Quick text* can enable or disable the faster font rendering software in the FaxPack software and *Compression* affects the storage requirements of pages held in memory – it's best left on.

Faxing a file from any application is just the same as printing it. With the printer driver loaded just select the appropriate option and away you go. However the tricky bit is dialling the number, and there are three ways of doing this:

- Dial manually. Click the *Don't dial* and then start to print the document you're sending. As soon as the first page is completed FaxPack will ask you to dial the number. Click OK when you're connected. If you will always want to dial manually there is a configuration setting in the Fax Manager.



Status: On hook and ready to send

Destination:

☐ Don't Dial

Text format: ● Portrait ○ Landscape

Title text: Corpus.Bold

Normal text: Corpus.Medium

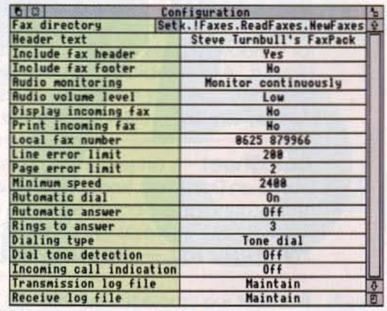
Resolution: ○ Standard ● Fine

Halftoning: ● Screen 1 ○ Screen 2 ○ Screen 3

☐ Title ☐ Quick text ☒ Compression

Setting up Printer FP...

...and configuring the Fax Manager



Configuration	
Fax directory	Set k.!Faxes.ReadFaxes.NewFaxes
Header text	Steve Turnbull's FaxPack
Include fax header	Yes
Include fax footer	No
Audio monitoring	Monitor continuously
Audio volume level	Low
Display incoming fax	No
Print incoming fax	No
Local fax number	0625 879966
Line error limit	200
Page error limit	2
Minimum speed	2400
Automatic dial	On
Automatic answer	Off
Rings to answer	3
Dialing type	Tone dial
Dial tone detection	Off
Incoming call indication	Off
Transmission log file	Maintain
Receive log file	Maintain

- Dial automatically by entering the number in the *Destination* area then print the document.
- Include the fax number in the document itself. This is intercepted by FaxPack and automatically dialled before the fax is sent.

This particular facility used with Impression and the mail-merging Importer software instantly provides the software with the ability to send a fax to multiple destinations with each one personalised. You simply include the fax number in the database of destinations and merge it into the document. When it is printed to the FaxPack the fax number is auto-dialled and the fax sent.

Fax Manager

This part of the software handles configuring the hardware, as well as the sending and receiving of faxes. The configuration window contains a very complete set of options which can be divided into sections.

The options dealing with incoming faxes involve whether to auto-answer in the first place – only really for use if your fax line is separate to your voice line, and how many rings to allow before connecting, which means you could have auto-answer on your voice line but it's risky.

If auto-answer is off clicking the *Receive fax* option on the Fax Manager's iconbar menu initiates receiving a fax. Incoming faxes should be saved to disc, with the path name specified by dragging the *Set* icon to the directory window or you can type it in.

You can initialise the system to change the icon when a fax has arrived, display incoming faxes on screen as they come in using the FaxView software, print them immediately or just indicate one has arrived. If faxes are printed as they arrive you could set the save directory to *null:* in which case they won't take up disc space.

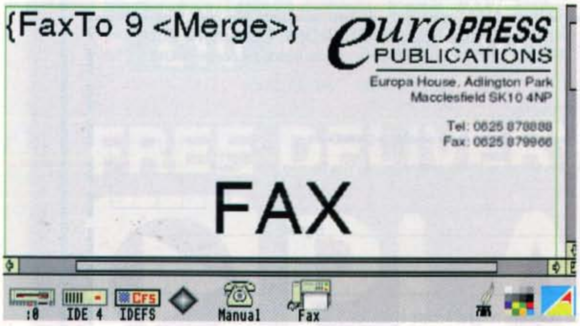
Error handling on incoming faxes is done on a line-by-line basis. FaxPack counts the number of incorrectly received lines and if the number exceeds the user-controllable line error limit the whole page is sent again. Ordinary fax machines can't usually re-transmit pages.

Output errors, where the receiving machine requests a page to be re-sent, are also counted. If the number of re-sends exceeds the Page error limit the request is ignored – a low number is best. Telephone lines are notoriously poor in quality so too low a value may result in a page being requested again and again.

The Send fax options mostly cover various header and footer items while both send and receive are affected by the Minimum speed setting – depending on how well the machines are communicating they may select lower and lower speeds. This setting controls how low FaxPack will go.

You can also set Pulse or Tone dialling. The former is for the old-style telephone exchanges while the latter is for modern internal phones or BT's System X exchanges. FaxPack can automatically detect a dialling tone but again this only works for modern exchanges – with old networks this option should be off.

You can also have FaxPack output – through the computer's speaker – the sound of the fax communication on the telephone line. This is useful for monitoring what's going on and, if you use it to autodial for voice communication, you can hear the ringing and tell when someone picks up the phone.


{FaxTo 9 <Merge>}

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FAX

Performing a "Fax - merge"

How FaxPack works

A standard fax machine is essentially a scanner which takes in a piece of paper and converts the image on it to a digital electronic form. This is then sent over the phone line to another fax machine that uses its built-in thermal printer to reproduce what was sent.

The main loss of quality is during the scanning process. For a start the paper may not be fed into the machine straight which means horizontal and vertical lines will appear thickened and jagged. Any areas which have hatched lines or a checkered design may well suffer from interference patterns.

Shading of pictures can only be approximated and the cost of the fax machine will have a significant effect on the quality in this area. The scanning resolution is usually only 200dpi which is just enough for reasonable quality transmission.

With FaxPack the situation is quite different, most of the problems associated with scanning simply don't exist. The fax image is created as if the page were being sent to a printer – which, in effect, it is – so colour shading for pictures is resolved correctly and fancy text is printed as well as the Font Manager can do it. The only area that might still suffer is highly detailed hatched or checks.

IBM vs Acorn

When a Risc OS application uses a printer it simply redraws its on-screen page while the printer driver re-directs and converts the output to a form that's appropriate to the hardware. This means that any graphic image or font will appear correct on paper exactly as it appeared on screen.

Exactly how the printer driver drives its hardware is irrelevant to the application doing the printing. The only exception is the PostScript printer driver where the fonts in the printer have to match those in the computer – although even this problem is circumvented in Risc OS 3.

On IBM PC-compatibles running the Windows interface the situation is completely different because applications send a description of the page to the printer driver, not an actual image of it.

This means, for example, that only the fonts the printer driver understands can be used – more advanced PC applications ask the printer driver what fonts can be used. So the user is limited by the printer driver.

On PC-compatibles a fax card behaves like a printer driver, just as it does with FaxPack, but is much less versatile.

File transfer

FaxPack can recognise when it's been connected to another FaxPack and when this happens information other than faxes can be transferred. As this review was being written, software to allow Archimedes files to be transferred directly was being completed.

In addition CC will be publishing complete details of how to control FaxPack so that other utilities can be written by third-party suppliers.

Summing up

It's been a long wait but FaxPack is certainly worth the price in terms of ease of use and quality of transmission. The added extras like file transfer will be very useful andd they'll be available by the time you read this.

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Primary Site £60 — Secondary Site £150

DataSweet/PC - the established software pack on the Archimedes will soon be available for Windows 3 users on PC compatibles and RM Nimbus. All the features of the original, with special features for Windows 3 users.
Primary Site £60 — Secondary Site £150

DataSheet - is an enhanced spreadsheet based on DataCalc from DataSweet. It has many more sophisticated features, yet retains the simplicity of use as the original DataCalc.
Primary Site £60 — Secondary Site £150

Banner - a simple to use, RISC OS, sign writing application for printing LARGE text using Acorn's outline font technology.
Primary Site £20 — Secondary Site £40

Prices include P&P but exclude V.A.T.

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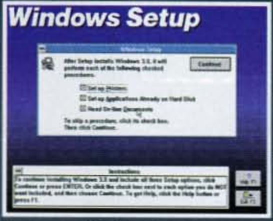
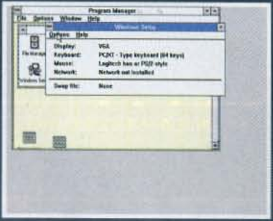
When worlds collide

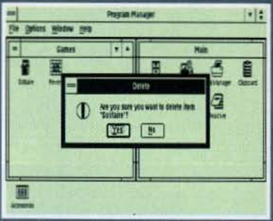
Steve Turnbull turns his Archimedes Risc machine into a PC for a while



You can run Windows 3 easily


Display: VGA
Keyboard: PC/XT - Type keyboard (84 keys)
Mouse: Logitech bus or PS/2 style
Network: Network not installed
Swap file: None

Changing mode on the PC isn't so easy



Are you sure you want to delete item 'Solitaire'?

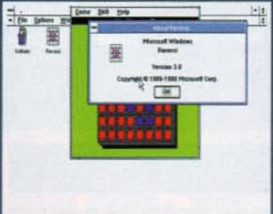
Windows within windows

Program Manager
Paintbrush - (Untitled)
Yo, dude!

The PC equivalent of !Paint, in CGA mode

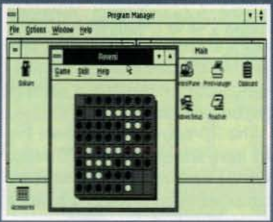
Program Manager
Main
Are you sure you want to delete item 'File Manager'?

Keyboard control has its risks



Microsoft Windows
Reversi
Version 3.0
Copyright © 1985-1990 Microsoft Corp.

Some functions exist on all types of windows



Light relief in the PC world

Product: 386PC
Price: £495 (1Mb) £625 (4Mb) Acorn PC emulator 1.06 or later required.
Supplier: Aleph One, The Old Courthouse, Bottisham, Cambridge CB5 9BA.
Tel: 0223 811679
Fax: 0223 812713

THE IBM PC-compatible is the industry standard computer, or so the hype would have us believe. It is true to say that there are perhaps 200 PCs for every one Acorn machine, and those are found in businesses, whereas the Risc OS micros are in the home and education.

The prevalence of the PC-compatible – popularity is certainly not the right word – means that a lot of software houses can thrive in the market, so for any job there are lots of programs to choose from.

The Archimedes is starved as far as quantity goes, but what exists is of excellent quality.

However, professionals who know how good the Archimedes is are in a quandry. They'd like to use the Arc but at work they are forced to use the PC.

Acorn themselves went some way to solving the problem by producing the PC emulator software. This is an application that pretends it's a PC and can run standard PC software. It's slow, even on an A5000, but it does work and that in itself is a miracle.

A better solution was needed,and after Acorn declared that they wouldn't be producing a hardware version of the emulator two other companies began to develop PCs on a card that could be plugged into the back of the Archimedes and provide complete compatibility with the PC world.

First past the post is Aleph One with their 386PC card. It comes with a 386SX processor running at 20MHz, 1Mb of ram upgradeable to 4Mb, and there's a socket on the board for a 387SX maths co-processor which will speed up programs that do a lot of calculations.

There's no floating point emulator on the PC, and for some programs the chip will be essential, but if you want to run such a program you'll know whether you need the chip or not.

What you also get are additional serial and parallel ports,which mean that you can print from the board directly. Also some PC programs have dongles,and plugging them into the Archimedes printer port would be ineffective.

The pre-release multi-tasking version will ultimately provide the same functionality as the newest PC emulator from Acorn. Currently the mouse works fine in mono-tasking mode but becomes disconnected when multi-tasking.

In the final version the mouse driver will work in multi-tasking mode, but you'll be able to switch back from PC mouse by clicking the Menu button.

Standard PC mice have only two buttons which are emulated by the left and right Arc mouse buttons, leaving the middle one for this special function.

For practical use you'll really need a hard drive, and if you're going to be using a lot of major PC programs it'll have to be a big one at that – 20Mb is definitely the absolute minimum for the PC area of the hard disc so if you're storing Arc data on the disc as well your starting size must be 40Mb.

Creating a partition on the hard disc is relatively simple, but it's easy to forget that you need to use the PC program FDISK to make the partition useable.

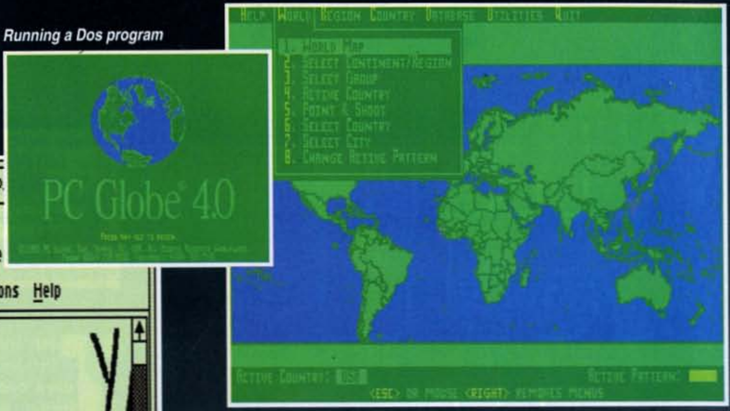
And then there's that moment of panic when it tells you that it's going to format your hard drive, so praying to the god of compatibility you let it go ahead and find out that it's only doing the partition.

The PC world is currently being wracked by the Dos vs Windows controversy. Although Dos stands for disc operating system, it actually means the whole operating system that drives the machine. It loads from disc unlike any of the Acorn machines.

The various versions of Dos are derived from the original PC and operate on the command line method, much like the old BBC Micro. You type in the commands and the operating system does it. Primitive, but a lot of the old software on the PC is designed to work from this environment.

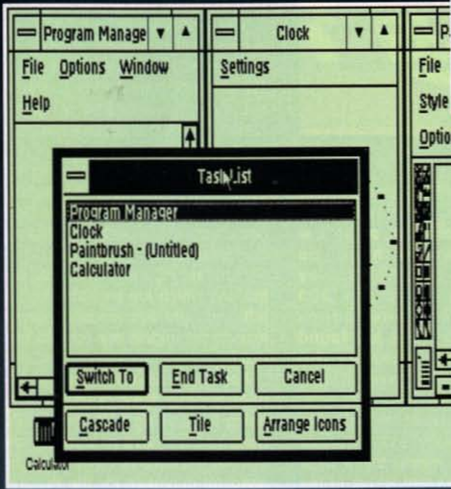
Windows, on the other hand, is a graphical interface using windows, icons, menus and a pointer. It is best used with a mouse, but since a mouse isn't a standard part of a PC it will also work from the keyboard, which is impressive.

In fact there's no real argument about whether Dos is better than Windows because the basic operating system is needed for the wimp system to operate. But the Window environment is very much easier to use than Dos – if you really need the command line you


Help World Region Country Database Utilities Quit
1. World Map
2. Select Continent/Region
3. Select Group
4. Retrieve Country
5. Point & Shoot
6. Select Country
7. Select City
8. Change Active Pattern
PC Globe 4.0
Active Country: USA
<ESC> or mouse <RIGHT> removes menus
Active Pattern:

Running a Dos program

Most programs can cope with CGA graphics


Program Manage
File Options Window
Help
Clock
Settings
File
Style
Options Help
Task List
Program Manager
Clock
Paintbrush - (Untitled)
Calculator
Switch To
End Task
Cancel
Cascade
Tile
Arrange Icons
Calculator

The PC task manager

A new world of software at your fingertips

can still get to it.

The real question is about software compatibility, most major software packages are now issued in versions that will work with both Dos alone and with Windows – the overall trend, however, is towards Windows only. To run a Windows application you need a lot of memory.

The Aleph One 386PC will run Windows without difficulty. If you don't have a multisync monitor you can only use CGA graphics, which is the lowest level of graphics on a PC . The system is usable but not brilliant.

With a multisync monitor you can have EGA or VGA and the quality is excellent. In fact with the pre-release version you can use EGA and VGA options as long as you operate in multi-tasking mode so the screen is in a window.

The release version will inform you that you can't use EGA or VGA if you don't have a multi-sync monitor.

Screen update when multi-tasking is a bit of a problem if you are scrolling lots of text in the Dos environment, for example issuing a dir command on a directory containing a lot of files.

The PC screen in the window is updated every time the Wimp polls the 386PC application. This could be as slow as once every half second, which means that you may miss half the information that's scrolled by.

But I must emphasise that this is the only time this situation occurs, and you can always switch to mono-tasking to make sure you get it all.

386 PC gives instant key response

Future enhancements

Running Windows on the board is a little sluggish – although it's certainly usable – however Aleph One will be producing a windows graphics driver.

Using this, all the instructions for drawing on the screen will be converted into the Archimedes equivalent and processed in the front end.

Relieved of the need to worry about the screen,the Windows system will run at a much higher speed. In an ideal world this would also allow you to use your Archimedes outline fonts in the 386PC window world, otherwise you'll have to buy separate PC fonts for on-screen work.

Printing is another area that could be aided. At present if you have a direct drive printer – from Computer Concepts or Calligraph – you can't print from the 386PC board. Any other printer will have to be swapped over to the PC output. If you have two printers you can have them both connected of course.

However, it will be possible to design a PC printer driver that interfaces with a printer driver in the Arc environment. Then you'll be able to print using the fonts you have in your Arc.

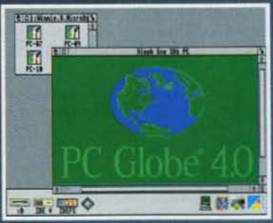
At present there's almost no real communication between the two systems. Screen output from the PC either goes to the Archimedes screen directly, in mono-tasking mode, or to a sprite which is drawn in a window when multi-tasking.

The PC world is slowly developing, and now has the ability to transfer data between programs. This facility could ultimately be used to allow data movement between the PC and Arc environments.

The only question I have about such moves towards integration is whether they are really necessary. To a programmer they are exciting and interesting, but it's a question of which is the dominant machine.

The PC board exists to make the Arc more acceptable in the PC world, with the eventual hope that devotees can prove that the Arc is the better machine.

But do such tremendous feats of programming skill have the effect of relegating the Arc to being a fast frontend with some interesting features?

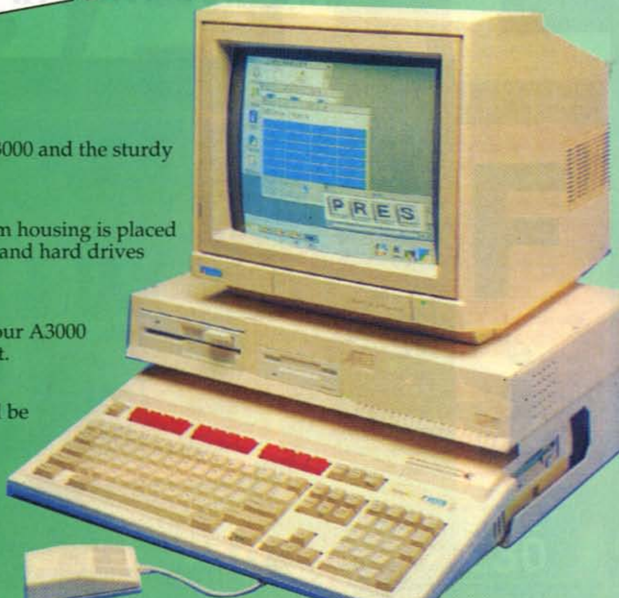


Dos within Risc OS

Conclusion

The version of the software reviewed was not complete, but it performed very well. I would have no hesitation in using this system myself even in its current form. There was no data loss and Windows ran quickly. And even in CGA, the graphics are acceptable.

AT THE FOREFRONT OF A3000 UPGRADES



Monitor Stand £24.95
Probably the best monitor stand available for the A3000 and the sturdy basis of your modular system.

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Expansion Card Case £14.95
If you're adding an expansion card (or podule) to your A3000 then you will need this case to connect and protect it.

Podule Expansion System £54.90
Allows two podules to be added to your A3000, and be working alongside each other simultaneously.

Disc Buffer £49.95
The definitive expansion for people that wish to add extra floppy drives. Support for 40 and 80 tracks. Will also allow you to add SCSI. We are continuously working on other options.

65Host 1770 DFS and DFS Filer £19.95
A Rom upgrade for the Disc Buffer that provides a DFS drive icon on the icon bar and 1770 DFS in 65Host, the BBC Emulator.

Various disc options 3½" & 5¼" floppy drives, 20 & 40 MB hard drives and 40, 60, 100MB ... SCSI drives. Do not be baffled by products with 'go faster stripes' ... call us for some honest advice.

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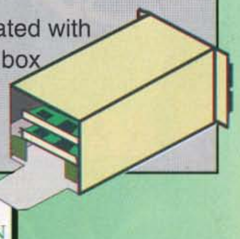

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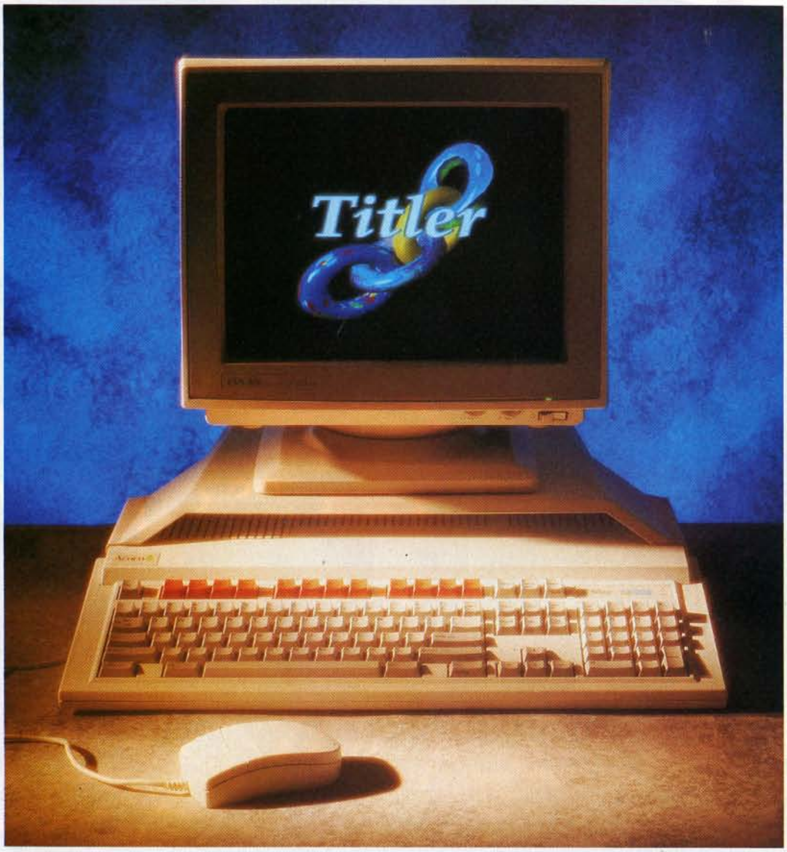
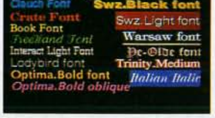
From the people who brought you Pro-Artisan, Render Bender and Illusionist; another link in the chain.



With Artisan II, Pro Artisan, Render Bender and Illusionist you can create amazing graphics and superb animations. But a picture, however detailed and complex it might be,can only say so much.

So with just that in mind, allow us to introduce Titler. It does exactly what the name suggests. It enables you to add words to your pictures. Titler is two programs combined, Titler and Sequencer. Titler is used to create screens containing text of any size and colour. It can provide drop shadows, underlines and rub out boxes. Using Sequencer you can present your screens using effects such as, unroll, scroll, fade, wipe, almost anything you can imagine.



Albert Font
Cinema font
Clouch Font
Crate Font
Book Font
Freeland Font
Interact Light Font
Lodybird font
Optima.Bold font
Optima.Bold oblique
Optima.Medium font
Sullikow Font
Swz.Black font
Swz.Light font
Warsaw font
Ye-Olde font
Trinity.Medium
Italian Italic

Add some animations from Render Bender or Euclid, some music from Sound Tracker and you have an amazing presentation to stop people in their tracks. Add a Genlock board and you can transfer the whole thing to video, overlaying onto any video source just like the professionals do.

In short it links you with the world of professional video, via the Archimedes.

Something Fishy

NO - It's just the Sprite Manipulation opt's available with 'Titler' Version 1.04

Archimedes + = TITLER

Obviously this is only part of the story, so for more information write or telephone for a fact pack. And we'll send you more words and pictures about Titler.

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EDUCATION Update

Going for gold

SELECTIVE Software (0458 43079) have designed a package aimed at making sports events easier to organise and run. Called SportsDay, this package runs on the Archimedes and costs £22.50.

Written for the physical education departments of schools of all sizes it enables you to organise teams based on tutor groups, teaching groups or on the house system. A wide range of track and field events are catered for, as is the ability to include events particular to your own school.

School records are included and various printout options help with the planning. The Archimedes analyses the results, records and team scores as they occur with a full results printout available at the end of the day.

New appointment

THE International Centre for Special Needs Education has appointed NW SEMERC's director Martin Littler as the secretary to the ICSE – International Information Centre in Special Needs Education.

The centre is the brainchild of Professor Stanley Segal and was officially launched in March. Its aim is to collect and disseminate information on all aspects of special needs education, new teaching methods and technology.

Drawing mad

SUNNYHURST Software have created a disc of drawfiles aimed at Key Stage 2 pupils. !Draw_Ideas costs £4.50 and contains five drawfiles planned to provide a variety of experiences with Draw. You can contact Sunnyhurst at 3 Earnsdale Avenue, Darwen, Lancashire BB3 1JW.

Spreading the word

NEW software house Cyber Tech Software Systems (0429 267511) have just launched their first project, Junior Sheet. This spreadsheet package has been co-designed with Brierton School in Hartlepool.

Junior Sheet allows spreadsheets to be set up to any size up to a maximum of 26 x 100 cells. Over 30 maths functions are supported as well as the ability to search and sort the spreadsheet data.

One particular nice feature is the ability to place custom menus on a spreadsheet to give quick access to various parts of the sheet. Added to this is a hotlinked graphics option, so that you can produce bar and pie charts and the like.

Although the spreadsheet has been developed to fulfil National Curriculum requirements, it would be equally of use in the home, with standard save formats all represented: CSV, TSV, Formulae and Draw. Junior Sheet is available for £35.

European education

THE annual education extravaganza in Britain is the BETT Show in London, while the biennial World Didac Expo in Basle provides a worldwide focus for the educational supply industry.

This year's event has a British focus and as well as a British IT stand. There is a two-day congress on the British education system opened by the Secretary of State for Education.

Acorn will be prominent, as will such software developers as 4Mation who have just translated Poster into German and released the French, German and Spanish SmArt files.

Making their mark

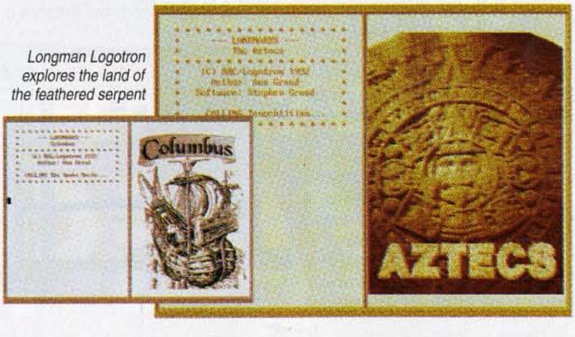
LONGMAN Logotron (0223 425558) have released two new discs in their Landmarks series. The Aztecs and Columbus coincide with the 500th anniversary of Columbus's discovery of the Americas. Both will be available in July.

The Columbus package invites you aboard for his historic voyage to America on the Santa Maria. Your guide is a young cabin boy called Pedro who will introduce you to life on ship as well as to the attitudes and customs of the time. This title will also complement the BBC School Television broadcast in October.

The Aztecs places you in the fabled city of Tenochtitlan, the capital city of Montezuma's Aztec empire. A 10-year-old girl called Jade Doll will help you to experience the city and explain the unique calendar, transport without wheels and human sacrifice.

Two further discs in this series are due for release in September: Elizabeth I and The Civil War. As with all the Landmarks series each title is £24 and comes with teacher's and pupil's booklets full of ideas and photocopiable activity sheets.

In particular, the teacher's guides provide advice on how to use the programs and suggest ways in which they meet the History, Geography and English Attainment Targets.



Longman Logotron explores the land of the feathered serpent

Special software

THE Honormead Group of Special Schools have spawned a software house called Honormead Software Solutions (0332 510951) specialising in the development of Archimedes computer programs for young children – nursery, infant and special needs.

In addition they also have a set of three programs to help teachers find their way around the Archimedes: Learning to Use the Archimedes I and II and Learning to Use the Desktop I, each of which costs £14.95.

Complete the Picture, £14.95, is a program designed to increase perception skills and supports single switch, keyboard and mouse control and is suitable for special needs, pre-school, primary and head injured pupils.

Other programs in the range include Amazing Animals, Switch Patterns, Paint with Splodge, People Match and Puzzle Program.

Special solutions

CASE Applied Research Unit at Keele University joined forces with Acorn to set up a one-day conference and exhibition of Special Solutions designed to offer people a comprehensive picture of what computers can offer people with special needs.

As well as talks and demonstrations from Paul Nuttall of NW SEMERC, Krys Boughey from Acorn and EMR's Mike Beecher, there was an exhibition of hardware and software.

Workshop sessions were run in parallel covering topics such as creative design, early learning, music and leisure.

New keyboards

THE Concept Keyboard Company (0962 843322) are entering their 10th year and to celebrate they are offering £50 off a new Concept Keyboard when you trade in your old one. The condition of your keyboard doesn't matter, but the offer is restricted to payment with order.

Bytes of words

Frank Jukes takes a peep at the new style of computer book

Product: Viewbooks – Weather Forecasting, Recreation and Tourism, The Management of Rural Areas, Industry: Structure and Change, Food Hygiene Training Pack
Price: £28.50 – £37.50
Supplier: Information Education, 24/33, The Business Centre, Bedford Street, Stoke-on-Trent, Staffs.
Tel: 0782 281643
Requirements: All formats except Electron

VIEWBOOKS from Information Education are an electronic version of the traditional printed book. Like all innovations, the concept has advantages and disadvantages when compared with traditional methods.

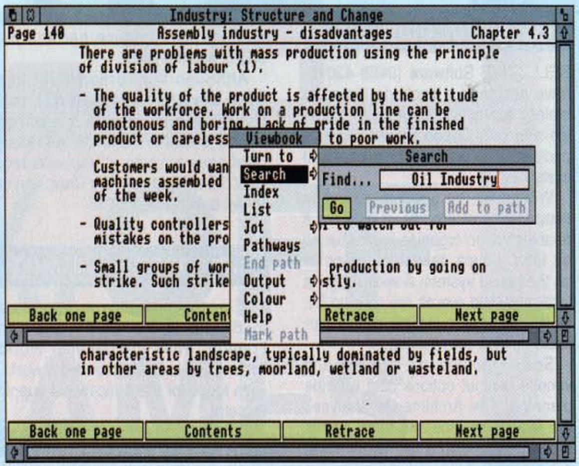
The obvious disadvantage is that the need to use a computer to simply read the text limits the opportunities for casual reading. At around 300 screen pages the average Viewbook consists of over 30,000 words and would make up a slim paperback of approximately 150 pages – something which is eminently more manageable and easier to dip into.

What you cannot do with a paperback is search for words or phrases which may occur anywhere in the text. The reader is limited to the author's index which may not be adequate for a student researching a topic or following a particular train of thought.

Cross referencing, the creation and retention of particular routes through a book, output of suitable passages to a printer or disc for use with a wordprocessor or desktop publishing package are all similarly impossible unless the book is in an electronic form.

For the average reader these opportunities may not outweigh the problems of accessibility but for the GCSE or A Level student – at whom the texts are aimed – the features can be very useful.

They encourage the student to be involved with the text, to interact with it and to rearrange and analyse it with the opportunity to export it for inclusion in a piece of research for example.



```
There are problems with mass production using the principle
of division of labour (1).

- The quality of the product is affected by the attitude
  of the workforce. Work on a production line can be
  monotonous and boring. Lack of pride in the finished
  product or careless                   to poor work.

  Customers would wan
  machines assembled
  of the week.

- Quality controllers                   to watch out for
  mistakes on the pro

- Small groups of wor                   production by going on
  strike. Such strike                   stly.

characteristic landscape, typically dominated by fields, but
in other areas by trees, moorland, wetland or wasteland.
```

Electronic books make searching easier!

Text on screen

The first time I tried to do this and send some text to disc I thought the transfer was a little slow. It was, but I had asked for all the text which amounted to 30,590 words and occupied 194k. Saving smaller amounts to disc – nothing less than a page is allowed – was no problem neither was transferring it via memory directly into Impression or Edit. The one problem I did find was that you are limited to four books open at the same time. But I don't think that this is likely to be a real problem in practice.

Rather than reading the texts in the usual linear fashion it is possible to move around by using cross-references provided by the book's editor. Each page may have up to three cross-references and they are easy to use. Simply clicking over the reference number within the text immediately puts the new cross-referenced page on screen.

A cross-reference is fixed and provides extra information on a particular topic, but another option is a *pathway* which is a record of a particular route through the text. This could be a route recommended by a teacher to emphasise a point or one built up by a student to help answer a question, write an essay or as revision. Each text may have several pathways all of which are individually identifiable and completely independent.

To take the customising of the texts even further you can make notes on screen which are kept at the back of the book. These are linked to the page which was open when they were written, the jottings are saved to the Viewbook disc and – like other parts of the book – they may be output to disc or a printer.

As well as the Viewbook discs the packs contain photocopiable resource sheets. These vary in number and type from pack to pack but include maps, diagrams and question sheets and are intended to expand the disc-based material, used with the various student activities included in the texts.

The currently available selection of Viewbooks covers a wide range of subjects most of which are available for the whole range of machines. A look through the list of authors reveals that many of them are the products of writers who are presently engaged in teaching in schools, colleges or universities, something which means that their work should be both relevant and current.

Aimed at the 16+ market as well as at GCSE and A Level, they cover a wide variety of topics. The range is increasing and it is possible to add your own texts to the list through the Viewbook Author program which translates wordprocessor files into Viewbook format.

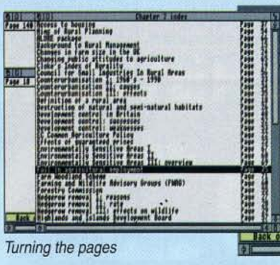
From food to frost

One of the most substantial of the Viewbooks in this selection was the **Food Hygiene Training Pack**. This includes chapters on the causes of food poisoning, the storage and preservation of food, food and the law along with a series of practical exercises. It has the approval of the Institution of Environmental Health Officers and can be used by students studying for their Basic Food Hygiene Certificate.

Easy to read and follow, the style is business-like and a lot of information is packed into the 270 pages. My only criticism is with the practical work. Much of this involves the incubation of bacteria taken by swabs. While there are warnings within the instructions, I would have preferred them to have been much more prominent. The investigations have the potential for some nasty infections if the student does not understand just how much care must be taken.

The other titles sent for review were part of a series called Geography for the 1990s. The first was **Weather Forecasting** and covered the methods involved in producing forecasts and explaining how the structure of the atmosphere and meteorological processes affect our weather. It gives an interesting insight into one of Britain's favourite topics of conversation.

Remote sensing and the use of computers in modelling the atmosphere are explained and the whole subject is linked to the needs of com-



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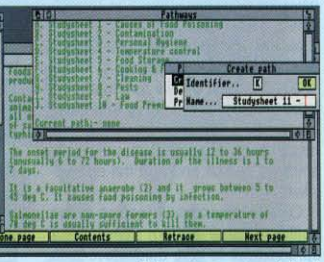
Access to housing
Aims of Rural Planning
ALURE package
Background to Rural Management
Changes in farm size in the UK
Changing public attitudes to agriculture
Cloke's Index of Rurality
Council for Small Industries In Rural Areas
Counterurbanisation I: 1960's - 1990
Counterurbanisation II: causes
Counterurbanisation III: effects
Definition of a rural area
Destruction of natural and semi-natural habitats
Development control in Britain
Development control: successes
Development control: weaknesses
EC Common Agriculture Policy
Effects of guaranteed prices
Environmentally Sensitive Areas I
Environmentally Sensitive Areas II
Environmentally Sensitive Areas III: overview
[illegible]
Farm Woodland Scheme
Farming and Wildlife Advisory Groups (FWAG)
Forestry Commission
Hedgerow removal I: reasons
Hedgerow removal II: rate
Hedgerow removal III: effects on wildlife
Highlands and Islands Development Board
```

Turning the pages



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Studysheet 1 - Causes of Food Poisoning
Studysheet 2 - Contamination
Studysheet 3 - Personal Hygiene
Studysheet 4 - Temperature control
Studysheet 5 - Food Storage
Studysheet 6 - Cooking & F
Studysheet 7 - Cleaning
Studysheet 8 - Pests
Studysheet 9 - Law
Studysheet 10 - Food Premi
Current path:- none

The onset period for the disease is usually 12 to 36 hours
(unusually 6 to 72 hours). Duration of the illness is 1 to
7 days.

It is a facultative anaerobe (2) and it grows between 5 to
45 deg C. It causes food poisoning by infection.

Salmonellae are non-spore formers (3), so a temperature of
70 deg C is usually sufficient to kill them.
```

Pathways are a powerful too!

merce, industry and society in general. Up to date examples such as the flooding of Towyn in 1990 are used to emphasise the points made.

Towyn has its tourists, but it is Skegness, among others, which is used in **Recreation and Tourism** to help describe how important leisure industries are becoming part of the nation's economy. Recreation in urban areas, Britain as a holiday destination and the British abroad are all described and used to show how opportunities for leisure have increased in recent years.

Town and country

In **The Management of Rural Areas**, issues arising from urban expansion and rural decline are discussed and case studies are used to examine how rural areas may be managed and protected. Like the other books, this one starts with a list of Key Ideas to focus the reader's attention on important issues connected with the subject.

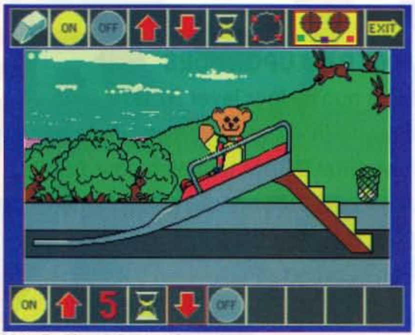
As someone coming to the topic for the first time I found these to be very useful. With the help of these Key Ideas, the very readable text and pertinent statistics and examples the book is very easy to understand.

In contrast to the problems of our rural areas, **Industry: Structure and Change** looks at developments in a range of important industries. Examples are used throughout to illustrate how the increasing application of modern production methods and competition from new industrial powers have shaped industry in recent times.

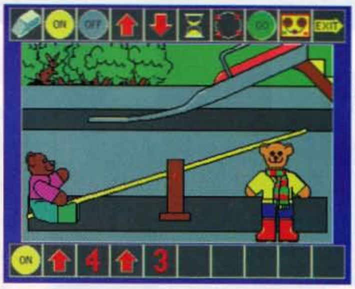
Governmental influence on change is also demonstrated by Nissan's decision to locate their new factory in Washington, Tyne & Wear, to the development of London's Docklands and from the implications of glasnost and perestroika to the creation of special economic zones in China. The text aims to reflect the requirements of the National Curriculum at GCSE level. It not only succeeds but is interesting too.

Summing up

The Viewbook concept is not new and doesn't really seem to have taken off yet. But this series is well worth a careful look. Anyone searching for an up-to-date and flexible resource would do well to evaluate its potential. I doubt they would be disappointed.



Make Freddy wait for his slide...



... or just go up and down

Phil Tayler finds himself on playground duty

Playground bear

Product: The Playground
Price: £29.95
Supplier: Topologika, PO Box 39, Stilton, Peterborough PE7 3RL.
Tel: 0733 244682
Requirements: Risc OS

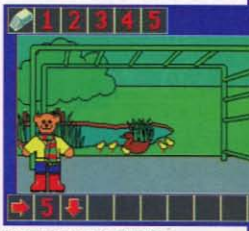
TOPOLOGIKA have already used the teddy bear, Freddy, as the hero in Freddy Teddy and Freddy's Adventure. So his fans will be delighted to see him again in this program designed for the early primary school age range. This time Freddy is addressing the important aspects of sequencing events, visual discrimination and spacial awareness.

The program puts Freddy in a playground with a slide, swing, climbing frame, see-saw and roundabout. All these are colourfully drawn and immediately attractive to young children, who can move Freddy with the mouse, arrow keys and spacebar or a concept keyboard.

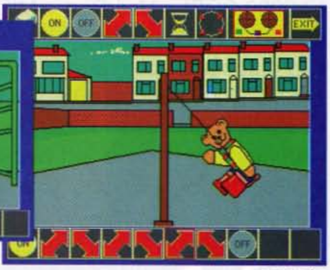
The concept keyboard option gives you two A4 overlays – words only or just pictures – to cover a wide range of children's abilities. Mouse control is simple with a large arrow moved to point to the different areas of the playground.

Five areas of the playground can be selected and a particular piece of apparatus will appear. The children can then make a variety of different things happen. On the see-saw is one of Freddy's friends. Click the on button and Freddy will sit on the other end, the up and down buttons operating the see-saw.

At first this is enough, allowing the child to explore how the different buttons work. However, it is possible to work in procedural mode. Here a sequence of actions can be built up at the bottom of the screen. These can then be tried out with some very cute animation on screen. Any errors lead Freddy to shake his head accompanied by a sample of No, No, No. To change your response, use the erase icon and remove the last action in the sequence.



Movement can be simple...



...or complex

Sampling the effects

The icons available in procedures include on, off, up and down as well as wait. The latter is used to let Freddy pause before sliding or when in continuous mode the action repeats until the mouse is clicked. In addition to erase there is a go button.

Sound samples are used on a number of occasions with laughter as Freddy goes down the slide, as well as Freddy telling the child when he is getting on or off.

Children can decide how high Freddy can swing, while the roundabout with its five coloured sectors can go clockwise or anti-clockwise, experiencing the numbers one to five and their relative effects. The climbing frame has the bear jumping on to it to move along and jump off, while the slide means Freddy has to climb up the steps, pause and slide down.

There is a lot of educational value in this program, with children discovering the use and concepts of on and off, left and right as well as learning how to build a sequence. There are opportunities for teachers to reinforce many of the concepts away from the computer and several well-written pages of ideas are included.

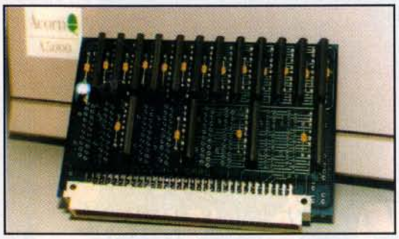
Screens can be printed at any time and an option will print outlines as well block shading or colours depending on your printer. Do be careful with a 1Mb machine though as space can be a little tight.

Summing up

I have not made much use previously of programs from Topologika, but this superb program will certainly encourage me to seek out Freddy's earlier adventures.

Its beautiful graphics will appeal to young children, as will the sampled sound. Added to this there is a genuine educational purpose behind the program.

Vertical Twist



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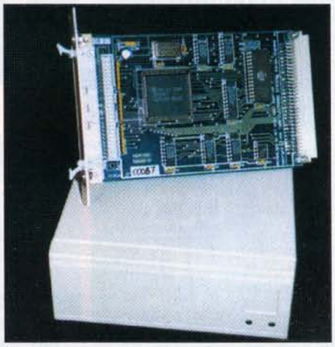

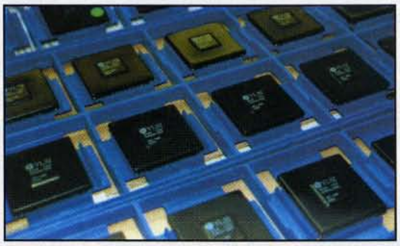

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• Vertical Twist Products were previously marketed by The Serial Port •

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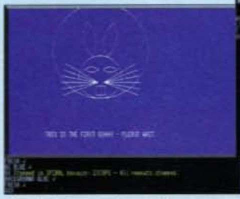
Units 11-14 White Hays North, West Wilts Trading Estate,
Westbury, Wiltshire, BA13 4JT
Tel: (0373) 824200 Fax: (0373) 824300

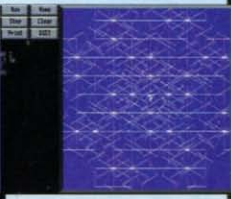
Vertical Twist

Product: Screen Turtle
Price: £39.95 (Concept Keyboard driver £5)
Supplier: Topologika, PO Box 39, Stilton, Peterborough PE7 3RL.
Tel: 0733 244682
Requirements: Risc OS

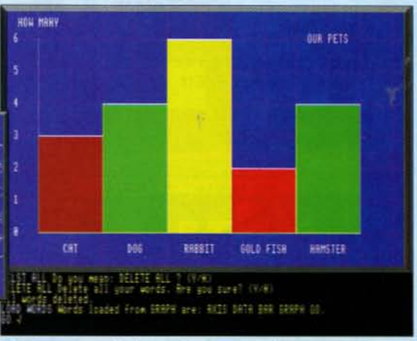
Shelling out

Rog Frost tracks down a new way to learn Logo


Simple to use turtle graphics



User-friendly interface



```
IST ALL Do you mean: DELETE ALL ? (Y/N)
LETE ALL Delete all your words. Are you sure? (Y/N)
 words deleted.
OAD WORDS Words loaded from GRAPH are: AXIS DATA BAR GRAPH GO.
GO √
```

The language and colour options are superb

YET another Logo variant? For the last 10 years schools have been bombarded with programs offering the turtle graphics subset of Seymour Papert's complete learning environment. For the last 10 years too, a few enthusiasts have embraced what these programs have to offer while the vast majority of teachers muttered quietly and the program has drifted to the back of a dusty cupboard.

Now, though, the National Curriculum almost makes turtle graphics compulsory. Schools are dusting off their old versions and find a colourless, boring, slow and difficult program which suffers from the need to remember strange commands and a very fussy syntax.

Worse still, every version has its own dialect which meant that skills learned on one version are difficult to transfer to another.

Topologika have now taken the plunge and produced a new program. It is purpose-written for the 32-bit range of computers and features the ease of use we associate with that machine. The screens are immediately attractive and encourage users to keep at work. It has the required speed expected from the Archimedes range and a comprehensive set of features. There is a well laid out manual with plenty of suggestions for use and a good collection of pupil worksheets.

So what does Screen Turtle offer? Just in case you have locked yourself away recently, perhaps it is as well to say that the program essentially links graphics and mathematics. Drawings are created by moving a pen – always called a turtle – around the screen. The pen is moved by commands such as FORWARD 100 or turned around by commands such as RIGHT 90. These simple commands can be put together to produce complex and even beautiful screens.

Screen Turtle has a comprehensive range of ready made words – in Logo parlance they are called primitives. These cover the expected range FORWARD, BACKWARD, LEFT, RIGHT, PENUP and PENCOLOUR, REPEAT and so on. The clever part of this program is that alternative words are permissible. For example, FORWARD can be abbreviated to FD or FOR, but an entirely different word, AHEAD, is also an option.

When these commands are mistyped the program will attempt to guess the intended word. Every other Logo that I've used has been particular about spaces between words and numbers. Not Screen Turtle. You can leave a gap or miss it. It's not fussy at all.

Taking command

Command mode is just the beginning. The ability to create your own words is really what these programs are all about. The method here is to type BUILD – or DEFINE or TO or CREATE – followed by your word name. This takes you to an editor where you put together your new command. The first new word for nearly all users is SQUARE. The style of Screen Turtle makes it all obvious. To BUILD SQUARE you would type:

```
REPEAT 4
FORWARD 100
RIGHT 90
AGAIN
```

As you type these commands, the action is shown on screen. Problems can be ironed out immediately because editing is very straightforward. Once you are satisfied with your new word, SQUARE, it can be used like any other word. It can also be saved on the disc for later recall. Of course, it is possible to use SQUARE to BUILD another pattern. Saving the pattern to disc will automatically save the words that go to make it up.

When words are re-loaded, there can be a problem. It is all too easy to use the same word more than once. Screen Turtle recognises this problem and sticks an extra letter on to a word to avoid it. Don't worry, it tells you as well.

Like other versions of Logo, Screen Turtle can work with variables. Instead of FORWARD 100 you can give a value to a variable and then go FORWARD by the variable. If you define a word, it is possible to change the value of the variable within it – you can produce very interesting shapes this way.

When using other Logos, I've always found that I lose turtles. When drawing triangles, the first two sides are easy but just what angle is needed, and how far must the turtle move to complete the third side? Screen Turtle overcomes this problem by using Basic type commands MOVE and DRAW so that I can shunt the turtle around to grid positions such as (200,200).

There is also a VECTOR option which allows the turtle to move to a new point relative to the current position in terms of coordinates rather than angles and distances. For me, this one feature turns an older, frustrating Logo experience into one I can cope with and enjoy.

One of the best features of Screen Turtle are its colour options. PENCOLOUR can be given one of 14 different values and this means that lines can be drawn in the various shades given. I have to say that on my pre-release version the choice of colours was odd with two nearly identical reds, two yellows and three whites. These are not adjustable at the palette.

But it's the fill options which really make the program. You just move the turtle into a space, set a PENCOLOUR or INK and type FILL and you get instant colour. There is though, one small problem. The colour flows from the tail end of the beast so you must place the rear end of the turtle in the shape. Also, FILLing is a one attempt job. It is only possible to fill on the background.

FILL is probably most useful to build into words. To colour up a screen there is a *mouse point and shoot* technique called PAINT. There is no need to type anything for this. Select a colour from a menu, move the mouse arrow and click. Simple.

Whole screens can be saved to disc as compressed sprites. These can be converted to standard sprites for use in other programs such as a DTP package. They can also be loaded back in for a quick background for further work. Ready-made backgrounds, such as mazes and maps are provided on the disc and these can form the basis of first rate tasks for youngsters.

Summing up

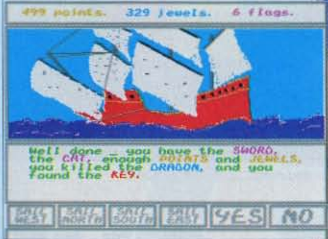
Screen Turtle is not, and does not pretend to be, a full version of the Logo programming language. It is just the turtle graphics part of it – the part most widely used in schools.

It's a shame that Screen Turtle is not a multi-tasking program and fails to use the standard Risc OS environment. But it is faithful to other, more traditional, versions of the program and will be easy for the intended young users. It is very friendly to use and is surely destined to become the standard turtle graphics program in both junior and secondary schools.

Avast shipmates

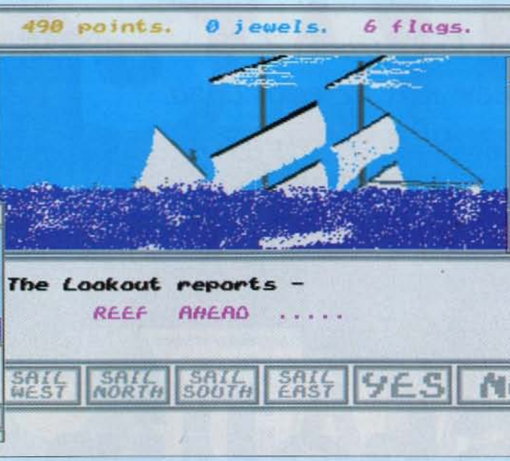
Marshal Anderson hoists the skull and crossbones as he gets to grips with pirates

Product: Pirate
Price: £23
Supplier: Chalksoft, PO Box 49, Spalding, Lincolnshire PE11 1NZ.
Tel: 0775 769518
Requirements: Risc OS


499 points. 329 jewels. 6 flags.

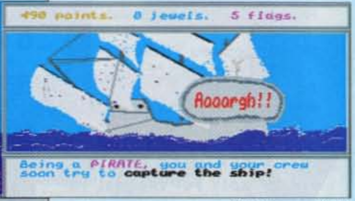
Well done _ you have the SWORD, the CAT, enough POINTS and JEWELS, you killed the DRAGON, and you found the KEY.

Exploration is the key


490 points. 0 jewels. 6 flags.

The Lookout reports -
REEF AHEAD .....

Random disasters keep you on your toes


490 points. 0 jewels. 5 flags.

Being a PIRATE, you and your crew soon try to capture the ship!

Fight the good fight

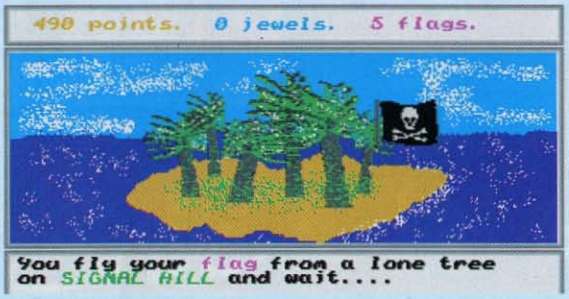
SEEING this package again took me back: Pirate was around when disc drives still cost more than the computer. It was jolly good then and it's one of the few early packages – along with Granny's Garden – that has stood the test of time.

The program uses a simplified adventure format to explore first the Unknown Sea and then an island. You are the pirate captain of the red ship and in the first part you sail around a 10 x 8 grid. The whole thing starts off fairly enigmatically: You don't really know what you're looking for or why, but in the meantime you can simply explore.

In both parts this is a very important aspect so the exploration of the area and careful mapping are really essential to the solution of the problems – or just finding out what the problems are.

As you sail around the Unknown Sea you discover various ports that you need to put into regularly to stop running out of food. You also come across seagoing problems like mutiny, rats eating the hard tack and – most importantly – other ships.

Sometimes these ships will try and run away, sometimes they will attack you, but any display of cowardice on your part will lose you points – so give chase and fight the dogs. Attacking other ships is the main way you get more points and jewels, and part of the eventual aim is to amass enough of these to get on to the second part of the package.


490 points. 0 jewels. 5 flags.

You fly your flag from a lone tree on SIGNAL HILL and wait....

A criticism of the BBC Micro package was that you were not told how many points you needed. The help option at the beginning of the Archimedes version tells you what you must do and Chalksoft also now supply a clue sheet for the price of an SAE.

Map helps

Having sailed about for a bit being generally unpleasant to passing ships, you will get the idea that you need to find a cat and kill a dragon. Both are fairly straightforward tasks that will be easy if you have constructed a good enough map.

Once you've sorted all this out you get on to part two. Here you are on dry land, looking for the cat's master, the imprisoned king. Again the landscape is a simple grid but this time there are plenty of dead ends to get lost in and cliffs to fall off so again mapping is vital. In fact, the route to the king's prison is nicely worked out so it would be the last place you would end up by just blundering about.

While seeking the distressed monarch you come across some interesting hazards in the form of lightning, Blackbeard and his gang, avalanches, crocodiles, wild boars and associated nasties all trying to get in your way and generally foul things up.

Finding the king is all you have to do. Once he's found the program takes over and fills in the ending which has you ruling one of the islands as the rewards for your endeavours.

The programs both work using a simple mouse-driven menu with north, south, east, west, yes and no as the only options you ever need. So the whole thing is very easy to run and is suitable for children of maybe seven and up.

There is a save option in the first part of the package so all your hard-won booty can be held over to another day. But the second part must be finished in one go. Once you have the solution to the second part it can be completed quite quickly so this is no great loss.

The content of the programs is identical to the BBC Micro version as far as I could see and it must be said that, as an upgrade, the package is a little disappointing. The graphics presented seem very crudely drawn and, although some animation has been added, some has disappeared from the original which made excellent use of Mode 7 graphics.

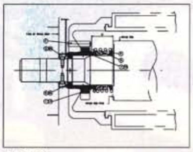
Having said that, the humour is all still there. The language used is wonderfully piratical, full of story-book expressions – it's a joy to play. It can occasionally be frustrating because many of the hazards are randomly generated and their outcomes beyond the control of the player but this is perhaps an adult complaint – I have been using it in class for years and it has been universally enjoyed.

Summing up

If you already have the BBC version and machines to run it on, carry on using that, the Archimedes is capable of more. But if this is one that has passed you by over the years it's well worth adding to your software library.

At its current price it is also worth buying for home use and children anywhere from seven to early teens will love it.

HOME ACCOUNTS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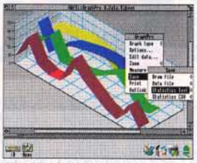
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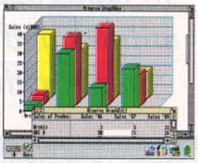

GRAPHBOX

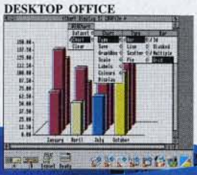
SYSTEM DELTAPLUS

EASIWORD v2

ATELIER

BUSINESS ACCOUNTS

BUSINESS ACCOUNTS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The short list

Jo Giles takes a look at a host of utilities and applications to make your Archimedes run smoother

Order, order for your files

Product: Organise 2
Price: £2
Supplier: State of the Arc, 29, West Lea Drive, Ringley, Wakefield WF3 1DH.

STARTING life as a public domain utility, Organise has now been released as a full commercial product with better file-handling and more features.

As the name implies, **Organise 2** attempts to bring order to the chaos on your floppy or hard disc system. Load the program and it sits next to your drive icon.

The best way to use it is to select the programs you use the most from your hard disc or floppy discs. Simply drag the application, file or directory on to the icon and these will be loaded as objects.

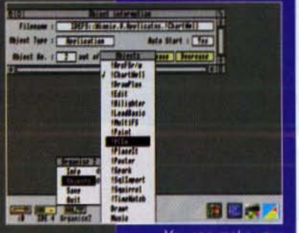
This means that in future you can run them by selecting the file or program you want from objects on the menu.

You can delete files just as easily by clicking Select over the icon. You cycle through the entries in a new window with the increase or decrease button – which is a little strange – and pressing the menu button will then give you the option to delete. The same window is used if you want to have particular files loaded each time you load the program or boot up the machine – should you set your StartUp file auto boot Organise. All you have to do is toggle a single button.

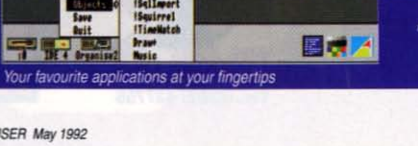
If you have a hard disc it will load the programs automatically while floppy disc users will be prompted for the right disc.

However the PD program Menon is certainly preferable to this one as you can create sub-menus and there is the option to load a program or application from a key press.

Organise 2's user-interface is a little idiosyncratic but for the price is a useful program which has a screen saver thrown in for good measure.



You can make your most used programs load automatically



Your favourite applications at your fingertips

Design tutorial

Product: Good Impression
Price: £26.95
Supplier: Word Processing, 65 Milldale Crescent, Wolverhampton WV10 6LR.

FOR the more imaginative or demanding presentations, take a look at **Good Impression** from Word Processing. The next stage from the First Impression tutorial, this new package also concentrates on Computer Concepts' Impression II DTP software.

The book and the three discs of examples aim to show you a range of design ideas as well as teach you the techniques needed to achieve them.

Good Impression begins with a look at Font Draw and creating a variety of drop capitals often seen in magazines such as *The Micro User*.

As with most good books of this type it not only tells you how to create them but indicates the most effective way to use this technique as well as what to avoid. The tutorial uses a great many examples and deals with the best ways of designing two columns and using and creating effective borders. From this it moves on to produce professional headlines which look complicated.

Stephen Ibbs takes you through the Dingbat character set in detail showing the effects anyone is capable of producing, from superimposing characters to creating eye-catching posters. Dingbats can also be used to produce some unusual borders and the book deals with this as well as how to use the standard and additional Impression borders.

Shadows and tints give DTP work that professional finish. Step-by-step instructions are given and you also find yourself guided through the intricacies of GradTint which also comes with Impression II.

The tutorial finishes with instructions on how to create grid texts before you are taken through the plethora of sample documents: School timetables,

Word for word

Product: Diction
Price: £15.00
Supplier: New Era Software, 204 High Street, Woodville, Swadlincote, Derbyshire DE11 7DT.
Tel: 0283 812818

SPELL checkers are one of the innovations unique to computers. So it was only a matter of time before these were joined by thesauruses and dictionaries.

Diction is a new product from New Era Software – a dictionary which you can add to. The version we have here is English but other language versions are under development with German being the next to be released. It is a multi-tasking application which sits on the icon bar until activated.

With a base dictionary of 7,500 words it can be used to check the spelling of a particular word. Type in the spelling you have, select Find and the main window will show the alphabetical listing where it should be.

You could select Guess which will come up with the closest match to the letters if you prefer. So you now have a word, but what does it mean? Choose the word in the main window and the definition will appear – sometimes there is more than one:

beat _1	to hit
beat _ 2	rhythm

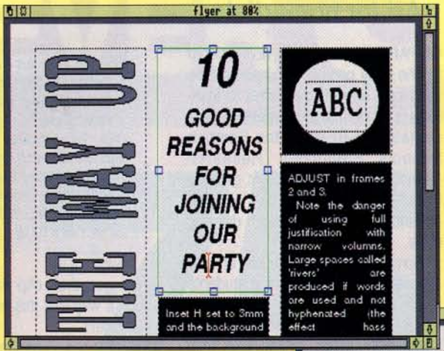
To create you own entries or edit an existing one, just select the Add button. Another window appears where you can type the word and definition.

You are limited to 20 characters for the definition but this is sufficient for a dictionary of this type. To delete a word and definition the process is the same.

Diction is very simple to use and you can save your new words and definitions using the save option on the icon bar. You can tell if any changes have been made by an asterisk on the title bar as you would expect.

One particularly nice aspect is the ability to drag words to a DTP or word-processed document. Just click the word you want, hold down the select key, drag it to your document and it'll appear at the cursor. A nice future enhancement would be if transfer could work both ways.

You can learn to create a variety of effects



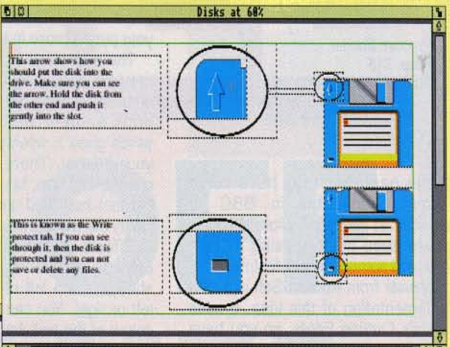
ADJUST in frames 2 and 3.

Note the danger of using full justification with narrow volumns. Large spaces called 'rivers' are produced if words are used and not hyphenated (the effect hass

Inset H set to 3mm and the background

stock orders, invoices, compliment slips and so on. If you have any breath left there is also a host of further ideas to work on.

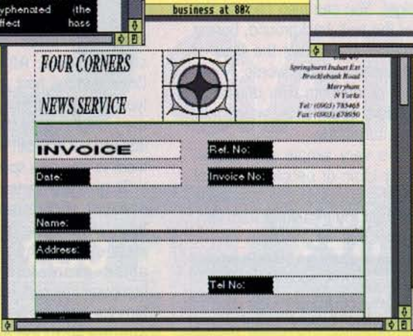
Impression is a very powerful package which can be used as a simple wordprocessor. With Good Impression to enhance the manual you are missing a great deal if you don't delve into this DTP package. Good Impressions superb whether you are a new or experienced Impression user.



This arrow shows how you should put the disk into the drive. Make sure you can see the arrow. Hold the disk from the other end and push it gently into the slot.

This is known as the Write protect tab. If you can see through it, then the disk is protected and you can not save or delete any files.

The only limit is your imagination



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Creating the right business image

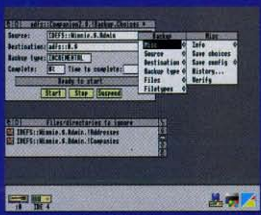
Back to basics: Making backups can be easy and fast

MAKING a copy of work – a backup – is something we all know we should do. However, a lot of people follow the *it'll never happen to me* philosophy only discovering the error of their ways too late.

There are many ways to backup your hard disc. Some solutions are easy to use, some are cheap but many people still have no backup should the unmentionable happen: An electricity spike, a sneaky virus or an errant key press. Risc Developments have released the **Hard Disc Companion** version 2.04 in an effort to protect you against all possibilities.

This updated version is faster with some new features and an interface which goes a long way to being foolproof. As the name implies it is for people with hard discs who intend to make a backup on to floppies. But there is the option to transfer your backup to other devices – a second hard disc, CD Rom, optical disc or tape streamer, as long as it is a proper filing system.

Transferring to floppies can be time-consuming and awkward when files are particularly long. HDC estimates how many discs you are going to need and prompts you for a new disc, splitting the files if necessary and erasing and formatting discs should it be needed.



Source: IDEFS::Minnie.$.Admin
Destination: adfs::0.$
Backup type: INCREMENTAL
Complete: 0%
Time to complete:
Ready to start

IDEFS::Minnie.$.Admin.!Addresses
IDEFS::Minnie.$.Admin.!Companies

A nearly foolproof interface

There are three sorts of backup available: Full, incremental or differential. The first backs everything, incremental covers files added or updated since the last backup putting them on to new discs, while a differential backup is similar but you can use the same floppies. Though slower than an incremental backup it means you use less discs.

The last two are date-stamped and details of time, date and length of backup are contained in the History sub-menu.

The interface and configuration are very simple to use. To backup your whole hard disc, open the directory and drag the source folder into it – the correct pathname will appear below this in the HDC window. However, you can just backup certain sub-directories by the same method. If you only want to backup certain files use the File window to specify these, or you may prefer to say what you don't want to be backed up so use the Ignore window. The program is intelligent enough not to let you both backup and ignore the same file. You'll also find that you can ignore objects in a directory to be backed up, but you can't backup objects in a directory you are ignoring. Rather than specific files you can choose to ignore or backup filetypes.

The Filetypes options are used to backup important data files which are updated regularly, but programs which save data as directories – Impression and Squirrel – will have to be specified under the Files options.

Product: Hard Disc Companion
Price: £52.88
Supplier: Risc Developments, 117 Hatfield Rd, St Albans, Herts Al1 4JS
Tel: 0727 40303

Your choices can be saved in two ways. If you are only going to have one set up for backing you can save your choices as a text file. This could be edited in Edit and will be used each time the HDC is loaded. However, if you are likely to want different sorts of backups you can save your configuration in a HDC file which you load when you need it.

Two other programs come with HDC: Restore and Retrieve. Restore reverses the backup procedure re-creating full pathnames as needed. The program is written on to the first floppy and when loaded you have four overwrite options:

- Always – overwrite everything
- Never – don't overwrite existing files with the backup versions
- Newer – look at the data stamp first
- Confirm – ask first.

Retrieve works in a similar way, restoring individual files from your backup to the hard disc. Once loaded a search field pops up for you to enter the name or, more usefully, two wildcard options. Discovered files appear in a window for you to drag them back to the hard disc. However, you can only retrieve one file at a time and you must use the copy of Retrieve with the set of floppies it is stored on. This is because a log file of those discs is stored in Retrieve.

The Hard Disc Companion keeps things simple and as fast as possible and it even caters for people with PC partitions on their hard discs. Good value for money when you consider what it could save you in time and sanity.

Headline hugging

Product: Banner
Price: £15
Supplier: Kudlian Soft, 39 Dalehouse Lane, Kenilworth, Warwickshire CV8 2HW.
Tel: 0926 55538

IN the past, you may have come across SignWriter in BBC or Archimedes format. It allowed you to create huge posters using its own fonts and some powerful features.

Banner from Kudlian Soft is a new implementation of this idea. It uses Acorn's Outline Fonts, so you have access to all the fonts in your folder as well as Jotter which comes with the software and is the default for the package. This means that you must move the font into your !Fonts folder before you load Banner.

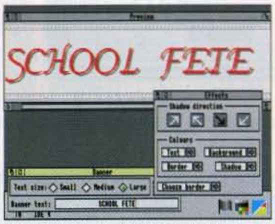
The software is extremely simple and straightforward and lets you produce simple long signs in minutes. The icon sits on the icon bar and it is here that you decide between continuous or single sheet output from your printer.

Double-click the icon and you are presented with a simple window for entering the text, and the number of lines at your disposal depends on the size of banner you want. Choose a small one and four lines will appear, a medium one gives you two, while large provides a single line. You enter text in the usual way and can save your purple prose in text format.

The next stage is to either print or preview your design. Print is simply done by clicking the button. Preview pops another window on screen which gives a wysiwyg impression of your banner. There is no option to change font size, but you can change the font itself and centre, left or right justify the text via the menu.

Effects to enhance your design offer four arrows which place a shadow – top left or right, or bottom left or right. You can also choose the colour of the text, background, border and shadow and select the type of border to surround your words: None, thin, thick or medium with double or triple borders of zig-zags, wavy, frilly or bunting surrounds.

This is a very simple application, ideal for children or people who want to create the occasional simple large banner. Truly multi-tasking it is very intuitive to use.



Text size: ◇ Small ◇ Medium ◆ Large
Banner text: SCHOOL FETE

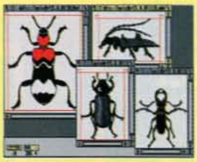
Create simple posters in seconds

Art for non-artists

CLIPART is ideal for the non-artist or for the busy person who has no time to create one-off diagrams to illustrate a particular document or presentation. SSERC – the Scottish Schools Equipment Research Centre – has an excellent graphic library which allows you to take advantage of other people's drawing skills.

Some of the drawings are of special interest to teachers and students in the science area, but many are of use to a wider audience. The discs have now been organised into subject areas. All are created in Draw, and the best aspect about this type of clip art is that not only are the diagrams correctly drawn and labelled but you can edit or customise them to your own specifications.

To give you some feel of what is available, there are sensing units, magnetic switch units, pulse generators, a computer key pad, interference patterns, strain gauges and a cloud chamber as well as a host of other bits and pieces from tubes to spirals and from eyes to chequered patterns.



A problem with clip art is that you usually need only a couple of items and you can never remember what's where. Desktop Projects have arranged their clip art collection in such a way that this need never happen again.

Product: Topic Art – General, Transport, Costumes, Entertainment, Bugs to Slugs, Road Signs
Price: £8 each disc
Supplier: Desktop Projects, Unit 2a, Heapriding Business Park, Ford Street, Stockport, Cheshire SK3 0BT.
Tel: 061-474 0778

Under the all encompassing title of **TopicArt** these drawfiles can be used in a variety of applications: DTP, presentations, design, graphs and so on. The single subject clip art discs contain 50 drawings each and cover a range of topics with something for everyone: From general, transport, costumes and entertainment, to bugs, slugs and road signs.

Each disc comes with an accompanying booklet which gives a black and white print of the drawfiles as well as basic loading instructions. Some of the pictures are stylised, others are illustrations but most are coloured. The drawings are large and beautifully drawn with good attention to detail and finish.

Taking a detour: Accessing those egocentric programs

Product: Detour
Price: £19.95
Supplier: Electronic Solutions, Ceralyn, Maindy Croft, Ton-Pentra, Mid Glamorgan.
Tel: 0443 430355

THE programming capabilities of the Archimedes have encouraged many people with little or no previous experience to create utilities, applications and games. Unfortunately this can cause problems. Over the last few months quite a few commercial products have been released which will work perfectly on the author's machines but if yours has a slightly different configuration you'll have problems.

Inexperience is usually to blame but that doesn't help you to get the most out of the program you have just bought. **Detour** from Electronic Solutions attempts to give you access to these egocentric programs.

It is a file manipulation utility which provides a flexible and easy-to-use way to overcome problems with software written to run from a specific filing system, drive or directory.

It works by intercepting calls to the filing system, finding the filenames and then processing them before giving them access to the operating system. An additional aspect is that you can deny access to a directory or an entire filing system – a nice way of protecting your important files from viruses, although it means you're locked out as well.

Access can be limited to read-only, write-only or both and for directories containing your applications – !Draw, !Edit, !Paint and so on – limiting to read-only will prevent unauthorised access but you can still run the programs.

The file access logging is also used in this area as you can discover which resources are being used by which applications, how files are accessed and where from – you can find out which games are being played.

Detour works by replacing the path name supplied by a program with either the full path or a complete replacement. The manual explains this fully, but, for example, should a programmer omit the ADFS prefix in a file's path name, when the program tries to load the file, the operating system will assume that you want to use the currently selected filing system which may not be the right one. So the load will fail.

By using the concept of path sets – a source path and a redirection path – Detour looks at the filenames given to the operating system and if it finds one which begins with a specified source path it will remove this from the filename replacing it with a redirection path.

You set up the details in one window accessed from the icon bar icon. The main window allows you to add source paths and redirections at will or load a file by dragging it into the window.

You can specify if a path is to be read or write protected and are told how many paths are in the current path list file. You can cycle through them using the arrows.

There is also the option to turn on or off the detour system. Each path list can be saved as a pathfile or you can save the details in text format as a file log.

The manual gives you a worked example and don't be put off if you think that this is too technical. The worked example is fine but you'll find that the redirection path will have to be edited if you have either IDEFS or ADFS hard drives.

The process is very logical and is extremely useful if you have some products you have been having difficulties with. A number of path files are supplied for particular products known to have problems. This is a utility which is definitely worth adding to anyone's library.

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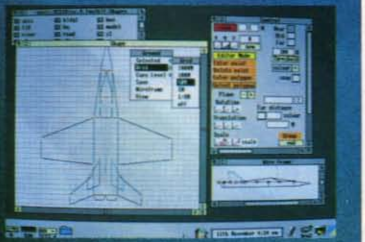

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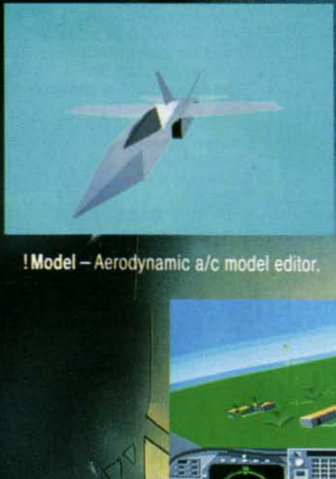
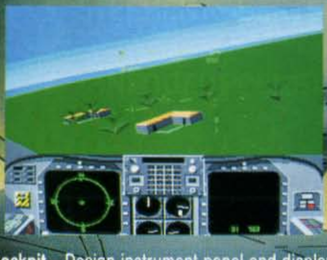


!Model – Aerodynamic a/c model editor.



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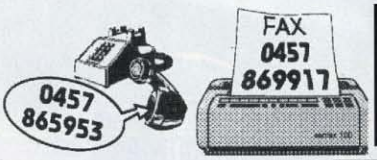

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From chaos

Teri Paul brings order to the brightest and best PD releases

BY popular demand I'm back to two pages this month, so settle down to some rather nice pieces of PD which have come our way. Remember if there's something interesting you'd like to put in the public domain, you could do worse than send it here.

To prove yet again the international flavour of *The Micro User*, Ivar Wind Skovgaard from Hellerup in Denmark has written a program to animate the Julia set which appeared on an earlier Archimedes subscription disc. A very impressive program, even if you don't understand fractals.

The **Quadratic Julia Set Real Time Animator** displays quadratic Julia sets using the inverse iteration method – a nice term which means that you can quickly explore different effects in real time. The program is not multi-tasking but it's fast, pretty and very clever.

You use the mouse, cursor and function keys to control the program, which enables you to change the complex constant in steps of 0.001, 0.01 or 0.05. There are 12 preset complex constants to choose from and you can toggle automatic and random animation.

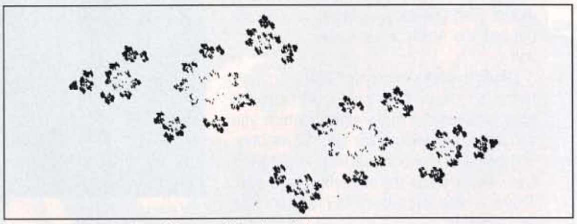
The mathematics behind the program are covered in the comprehensive help file. Ivar's next project is a picture of the Mandelbrot showing where the current complex constant is.

Staying with the fractal theme, Mike Curnow from the Archimedes Fractal Group has written to me recently. The group is now up and away and if you are interested in seeing some of their PD results contact APDL or the Archimedes Fractal Group at 30 Bowen Drive, West Dulwich, London SE21 8PN.

Mike has now released version 0.22 of **Fractal** his fractal project started in June, which aims to be the Archimedes version of the PC program Fractint. It comes with FracPal which allows you to edit 256 colour palettes for Fractal, but this utility can be used on its own too.

In brief Fractal is a superb multi-tasking program – though you can toggle to full screen mode – which makes the wonders of fractals available to everyone as the interactive help covers all aspects. The help is new to this version as are 3D-style push buttons and palette editing.

It is designed to be a universal generator, examining functions and images as well as being a platform for programmers to add their own routines with immediate wimp access and support of the 3D functions and so on.

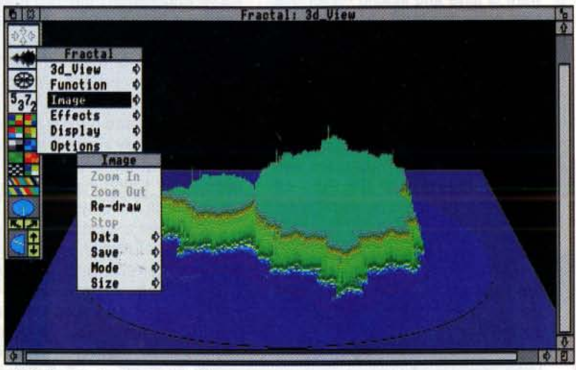


Animated Julia: Explore different effects in real time

When you load the program you will be faced with the initial fractal or Mandelbrot – make sure that you choose the 256 colour mode on the palette icon for the best results. Clicking the iconbar icon with Select re-opens the main window if closed.

You can experiment via the tools box or menu button which will let you zoom, change colours, create 3D images, plots and transformations as well as rotate or change the elevations in 5 to 15 degree steps all of which are redrawn smoothly and quickly.

This is a very polished piece of programming which should keep you occupied for hours, as this chaotic world becomes the more fascinating the more you delve into it.



Fractals were never so accessible

Provocation

Demos are great ways to try a game out before playing and quite a few are available now from a variety of software houses. Though **Provocator** from CTS has been on sale for some months now, a demo version is available.

This features three, as opposed to the usual 32, levels and you can find a copy squeezsd on to this month's Archimedes subscription disc.

Julia to Janet

Lancaster University's computer centre now has an Archimedes section in its PD library. It's updated at regular intervals, and if you have – or know a man who has – access to the Joint Academic Network, known as Janet to her friends, you can transfer files to your local mainframe, via Unix though, using the commands:

```
hhcp uk.ac.lancs.pdsoft:micros/
arch/riscos/a/"directory name"/
"remote filename" "local filena
me"
```

Access to the database reveals thousands of items of PD software on a huge variety of formats. Only 45 users are allowed on-line at any one time and you can contact Lancaster by Email too using:

```
uk.ac.lancs.pdsoft
```

You'll need Sparkplug 2 or ArcFS to decode and de-archive the files.

Hopelessly addicted

Since I confessed to a perfectly natural addiction to desktop utilities and sillies, I have been inundated by letters and discs from similarly like-minded people – thank you and don't stop sending your letters.

I did receive a prescription from the Desktop Doctor alias Stephen Spencer who recommended the application of the following. Some of the graphics interfere with each other, so quit using the Task Manager before you load a new one:

Waiter – this stick man taps his foot impatiently and points to where you click.

Windy – an icon bar program which lets your mouse pointer be blown about in calm, breezy, gale and hurricane conditions

Sights 2 – ideal for shoot-'em-up fans. Not only does your pointer become a gun sight, but click Select and bullet holes appear in your documents. But don't despair, a tap on the spacebar will remove the holes like magic.

Planes 2 – Wanda followers might have come across this before which like Sharks, replaces the fish with

another sprite, this time aircraft. Planes 2 adds parachutes.

Bug – not an error message but your new pointer with waggling antennae.

Fred2 – has had enough, as he now pulls his tongue out.

Eye – is particularly seductive as it winks when you press a mouse button.

I have also recently installed Watch on my Archimedes. Blue Eyes with a difference, a grumpy man in a window watches your every move. Close the window and a sign will appear displaying the message RuheTag – well, *I* know what it means.

Burn out

A host of screen savers are available in the PD and there are also some effects for the commercial program Twilight. The idea is to stop the icon bar becoming etched into your monitor which makes the shapes visible even when the monitor is turned off. The solution is to buy a new monitor, so prevention is definitely cheaper than the cure.

M-Burn is a simple PD screen saver. The screen goes black a line at a time – pressing the mouse returns you to the complete desktop.

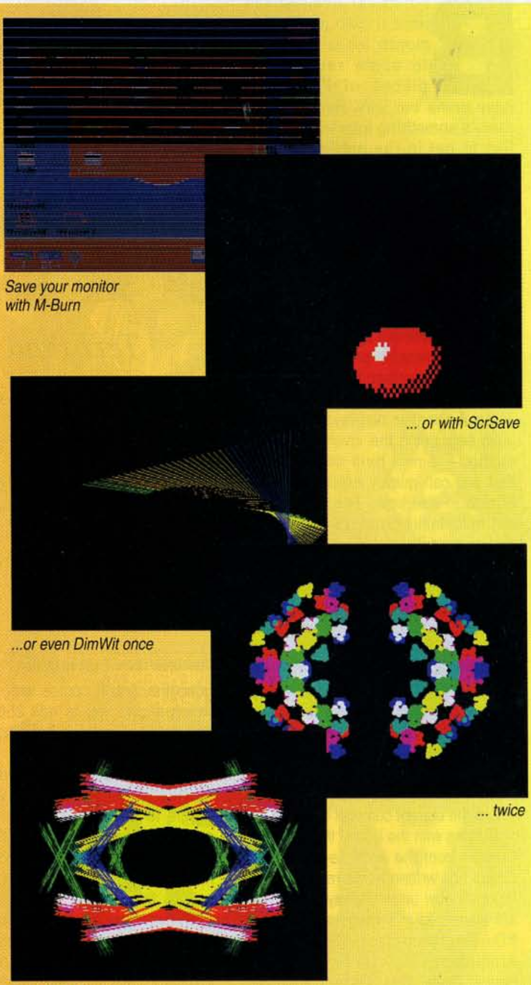
If you prefer more colour and animation **ScrSave** gives you a Mode 12 bouncy ball on a black screen. You can set the delay in hours, minutes and seconds. It's a little idiosyncratic in design but it is flexible and works. Glyn Davies' program is very simple but has the ability to save your configuration.

DimWit is another screen saver, but only works in minutes from 5 to 30 with a switch time between the three effects, which you can switch between each 1 to 10 minutes. You can also press the Action – right hand Ctrl – key to make the next effect take over. There is also the ability to hide the icon and settings.

Written by Gordon Henderson like the others on the market, DimWit looks at the mouse and keyboard every second or so to check whether the mouse has moved or you are pressing any key. If not DimWit takes over.

You can manually force it to activate by moving the mouse to the bottom left of the screen. An added extra is the ability to write and incorporate your own screen saver programs.

Ian Ashley has written the two Twilight Effects: Bugs is a simulation of little red creatures living, eating and breeding in a world of green plants while Starfield is gives a flying-through-space effect.



Save your monitor with M-Burn

... or with ScrSave

...or even DimWit once

... twice

... or three times

Library news

I have received a rather nice disc from MHPD, 3 Rodmell Close, Bromley Cross, Bolton BL7 9DT. Armageddon have written a lovely demo for the MH with depth, incredible detail and some beautiful graphic works showing off some of their nice programming techniques. It also has a long but informative message about the library.

RML PD, 24 Penrhyn Close, Norwich NR4 7LY now have a subscription service and newsletter worthy of note.

£8 a year will give you one Essential PD disc alternate months, a copy of the newsletters and 20 per cent discount on all orders.

Richard Leggett and Jimmy Covington of RMLPD has taken Alpine's Games Creator to concoct the **Attack of the Mutant Psychopathic Fruit Beasts from Mars**.

It's a colourful space invaders-type, and I'm surprised not to have seen more games in the PD using Alpine's program. The hero of this romp is Eddie the Carrott and the invaders are military-looking tomatoes and manic bananas among others, all flying around a star-field backdrop – pretty.

Duncan Webster contacted me some time ago. His library 8-Bit Software, 7 Ashdale, Thringstone, Coalville, Leicestershire LE6 4LW has been going from strength to strength proving that BBC public domain software is alive and kicking – I for one have never doubted it.

As I've mentioned before, the BBC PD is a must for any text adventure enthusiast and I've come across a couple of particularly interesting ones recently:

Dracula Adventure invites you to enter the world of Professor van Helsing. Courtesy of JFF PD – 49 Hollyberry Close, Winyates Green, Redditch, Worcs B98 0QT – it's a really excellent wheeze.

Imprisoned by the evil Count, you are the Prof. You must escape from the castle and destroy the Count in the process

But to begin with Dracula is the least of your problems. As with all adventures you must make a map. You start with a little black bag and a stake and mallet, but you'll soon acquire a frog, fire torch, mace and crowbar.

But will any of them let you find your way around the Whore of Babylon?

A great plot, nice puzzles, well written with a friendly interface and easy-to-follow parser – what are you waiting for? Unfortunately though it only works on ADFS systems.

If you prefer a good maze you can take a look at **Entropy**, and if you feel like being impressed by other people's programming prowess try and get hold of a copy of Lars Osterballe's **Scrolltext** – a Mode 1 screen with text twisting off the screen in a diagonal.

Informative and entertaining

If you have had any dealings with a computer before, you'll have come across one of the simplest of programs where a snake-like creature dashes around a box eating things. But cross your own tail – which gets progressively longer – or hit the box and you die.

The new Archimedes implementation from George Whyte is called **Snaker**. You use the arrow keys to eat little faces and error message boxes appear with relevant messages when you starve, crash or bite yourself.

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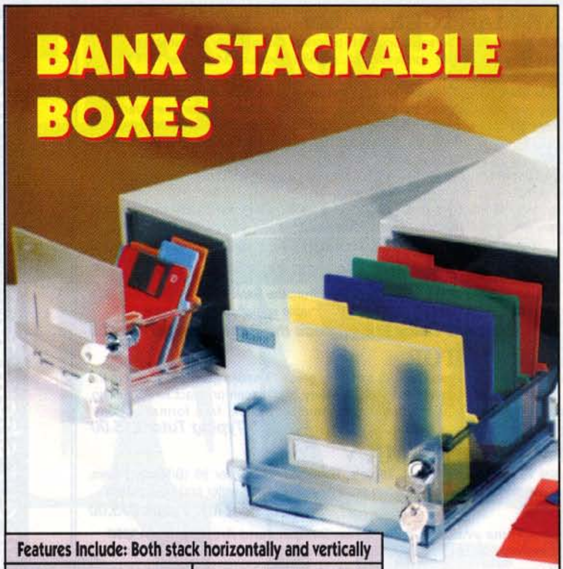

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Playing PC games

WITH so many good games to choose from on the Archimedes, it's hard enough to decide what to spend the old pennies on without adding any more choices.

But if graphic adventures are your cup of tea, the BBC and Archimedes have been bereft since the departure of Level 9. Wonderland was good, but what's new?

ECO QUEST
The Search for Cetus
SIERRA

PC adventures need more and more powerful machines and the standard Archimedes PC emulator hasn't got what it takes. Freedom comes with Aleph One's PC card – do check the ram you've got and it's advisable to set a PC partition on a hard disc too. Yes this hardware costs mega-pennies, but there are no short-cuts here. A word of warning: Though you can now get fast action and powerful games and adventures still watch the graphics requirements. The software emulator will give you EGA+ but with the PC card you can have VGA if your monitor can handle it.

OK pop pickers, favourite for Spring '92 are both from Sierra stable (0734 303322).

EcoQuest; £39.99

Alright, alright so it's for kids aged 10 plus. I know that one kid in the states finished it in four hours but it still took two reasonably mature females two days to finish it and we still didn't get 100 per cent. Any sexist remarks and we'll come round and sort you out! Due out in this country in May/June it is a totally excellent environmentally friendly adventure. Adam and rescued Dolphin, Delphinius – didn't you know all Elurians speak English – set out to stop the polluters and rescue the missing king, a whale called Cetus.

The graphics are stunning, Adam cannot die, the program gives you hints – OK, I didn't know that Americans called ballcocks *floats* so had to call Sierra's help line – and the animation of the dolphin and manta ray are of the highest quality.

There is information, humour, education and fun. Buy it for the kids, but make sure you check it out first as it is a totally excellent adventure.

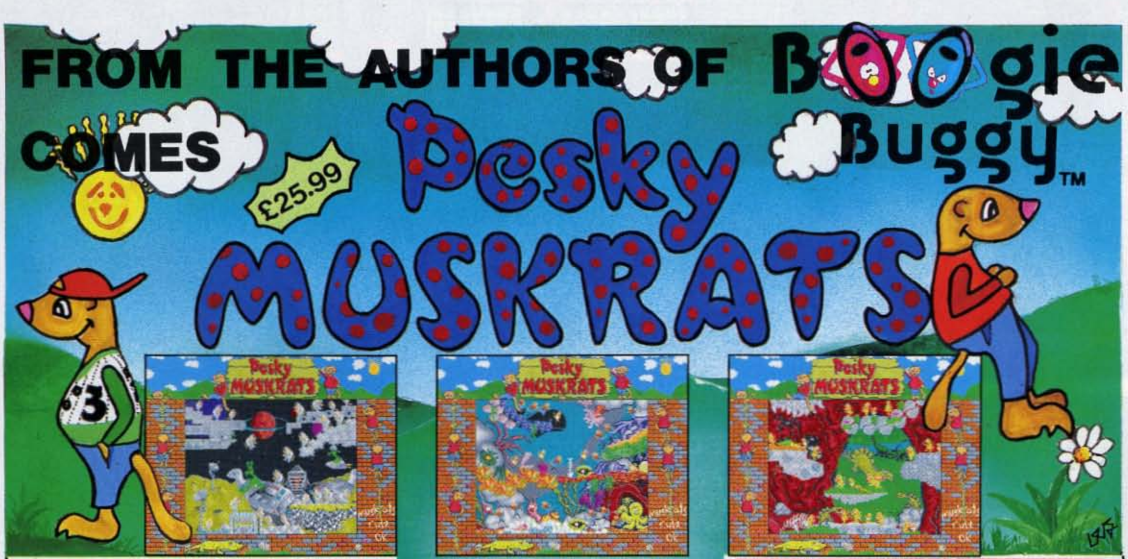
Leisure Suit Larry 5; £39.99

One of the classic heroes of all time, but in this latest hilarious jaunt, female co-star Passionate Patty goes undercover taking on organised crime, music industry and the US Congress, while Larry works for a sleazy TV program.

The superb quality of Mr Laffer's latest makes it a must – especially some of the facial expressions. With Larry looking for America's sexiest woman and promotion and Mr Bigg's gang of video salesman getting in the way, the farce gets more complicated when Larry boards a plane and takes the place of Patti, the FBI's latest secret agent.

If you are a Larry fan, I need say no more. But if you haven't met the Polyester Prince before, prepare to be hooked. The whole game is humorously sexist, but some of the innuendoes are less than discreet.

Sue McCarthy



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ALTHOUGH this game is about small, furry creatures it should not, on any account, be confused with Lemmings. I made this mistake and had to eat my critical words – and they didn't taste very nice.

Lemmings is about saving small, furry creatures from their own folly. Pesky Muskrats is about saving small, furry creatures from their reproductive proclivities – which unfortunately means disposing of them.

The scenario runs like this: Muskrats are cute but reproduce very fast and they're getting out of hand. The powers-that-be need help in controlling their population and want to get individuals – such as you – to take a crateload to look after.

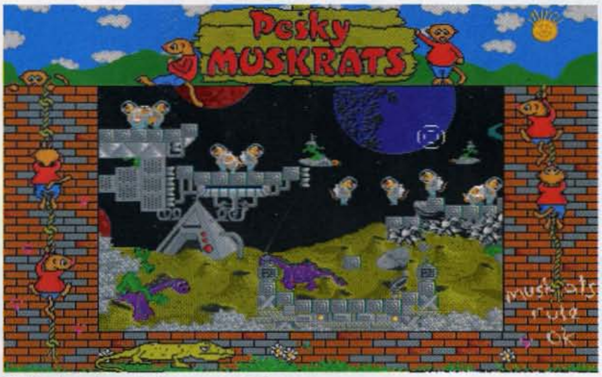
But these muskrats are little devils. And they keep escaping and multiplying, so to train you on the necessary culling procedures you are being supplied with a muskrat simulator. You can learn to be a muskrat population enforcement agent.

Okay that's the background, now the game. Because it's in 256 colours it comes on two discs with plenty of intermediate screens and instructions to guide you to muskrat demolition. There's music too, only one tune unfortunately, but it's pretty catchy and I didn't mind having it running all the time.

The screens are loaded in groups of three and each group is passworded so you don't have to go through the lot each time. There's a time limit for each screen and you can have three goes at a level before being carted back to the start.

Each group of screens depicts one of three muskrat types: Stone-age ones, scooba-diving (!) and astronauts. They all behave in particular ways – most notably the scooba-rats tend to float upwards. This ensures that your handling of the muskrats has to change for different screens.

One of my initial disappointments was the lack of a scrolling screen – wrong! It's just that the first three sets don't scroll, and it came as a shock when, on the fourth group, the muskrats wandered off the screen. I suddenly realised there was more to this game.



Solving the astronautical screens needs time

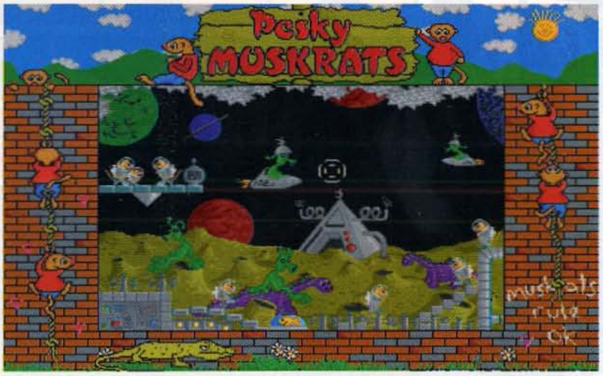
This was especially true when I came across a flashing trap. These are mentioned in the instructions but the first one wasn't quite what I expected. But what better to eat muskrats than a big brown bear?

When the screen starts up, muskrats, of whatever persuasion – there's no chance to sex them and I don't think it matters to them – appear and start to wander around the screen. These are all fully grown and when they encounter another muskrat there's a popping sound and a baby muskrat appears. You can tell it's a baby because it's little and wears a nappy.

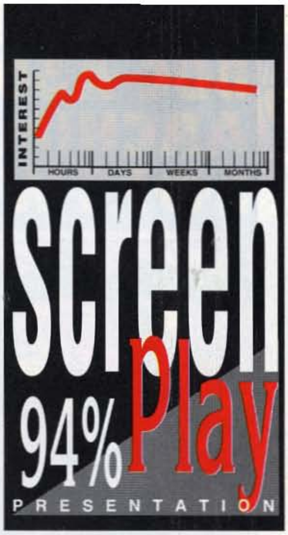
After a while the baby grows up and almost immediately becomes capable of reproduction. It has to be said that scooba-rats are perfectly adapted to their environment. They float around with their oxygen bottle, and when they encounter another adult, POP, there's a baby with its own little air-bottle – amazing. Likewise the baby astro-rats have a complete environment suit – dámned clever.

The speed with which they reproduce is dependent on the game level and the way they happen to be feeling at the time, it says here. If they're on a high more than one baby can appear in a single encounter, in fact dozens can pop up – rabbits have nothing on this.

So how do you control these productive animals? Essentially you're equipped with poison, bombs, bricks and a magnifying glass. The magnifier appears whenever you hold down Adjust on the mouse while the menu of features appears when you click Menu – surprise. The other items are made available via a menu which pauses the game – click on the feature you want with Select. The poison will kill one muskrat – you can place it in the path of an oncoming creature and it will die with its spirit rising up to that, undoubtedly overcrowded, muskrat heaven.



Baby astronaut muskrats wear suits



Muskrats walk on background features – or bump into them if they're scooba-ing. You can remove obstructions using bombs, but they don't harm the rats – unfortunately. Bricks, on the other hand, can be used to provide obstructions – stop those pesky muskrats coming into contact and you don't get any babies, hurray!

Or you can build steps to climb over things. Hint – muskrats can fall any distance without coming to harm. The magnifying glass lets you examine the background to discover any remaining pieces that are blocking muskrat movement. When in use the muskrats disappear from the screen.

I haven't mentioned how the time limit is represented, have I? Well take a look at the screenshots, see the crocodile at the bottom? Now scan to the right can you see the little fly? No? Well it's there believe me, the fly zips backwards and forwards, up and down, but slowly moves towards the croc.

Your time is up when the crocodile eats it. But it's difficult to tell how much time you've got left by looking at the fly because it flies all over the place – and it's risky taking your eyes off the screen.

Steve Turnbull

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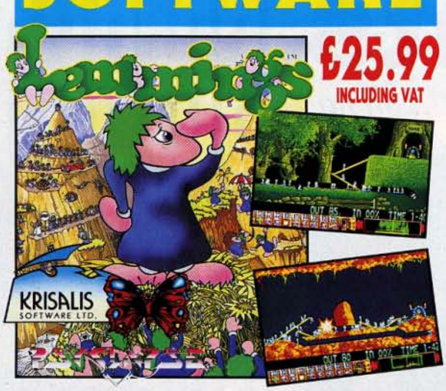
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X-Fire

...back in time

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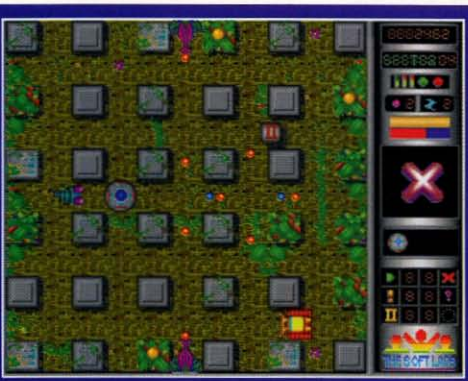
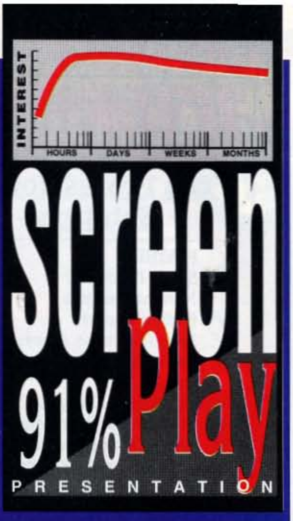




I WASN'T too keen on reviewing X-Fire – take a look at the screenshots, it doesn't look exactly thrilling, does it? Reading the back of the usual box, I spotted the dreaded words *...a welcome return to traditional arcade values.* Oh dear. *"I bet this game is about about as good as Spurs' defence,"* I said smugly.

Tottenham must have a pretty fine back four, that's all I can say. This game is GOOD FUN, something which seems to be overlooked by Arc software writers.

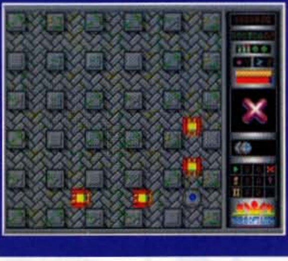
The authors, called The Soft Lads, have decided that a game should have not just one scenario, but several hundred. They have included the revolutionary *scenario-u-like* system inside the manual. Hours of carefree fun can be had just by making up your own storyline. But what about the game?

Well, you are a funny dome-looking kind-of-thingy trapped in a grid-type board. This board is only as big as the screen and the layout is the same for every level, except the graphics are different.

Nasty unsociable monsters appear on the edges and they won't go away. Oh no. You have to shoot them – don't look so shocked. When you've killed all the monsters, you get to go on to another level, with different graphics and more dastardly monsters.

The control system is easy enough to use. You have your four direction keys and when you press fire and a direction key, you shoot in the corresponding direction.

You can pick up some heavy power-ups, which make your job much easier. There's a Zap which blows up everything on screen, Cross Fire which means you fire in all four directions without having to use a direction key, and Rapid Fire and Split Bombs that split at every junction the original bullet passes. There are loads more power-ups too.



Now don't start feeling sorry for the monsters because they are quite capable of looking after themselves. Some just chase you, some buzz inanely around, some multiply if you shoot them and some can't be shot in the front. Once again, there are many more, some of the fiends even shoot back – rascals.

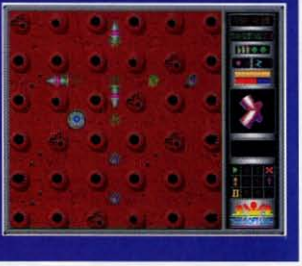
The game is very slickly programmed, with none of rough edges that usually plague Arc offerings. The graphics are extremely good, with some glorious animation and terrific screen fades – these aren't important but I like them.

The sound is great, with the kind of booms and bangs that don't irritate you after three nanoseconds. There's even in-game music, which mellows you while you are rapidly diminishing the monster population.

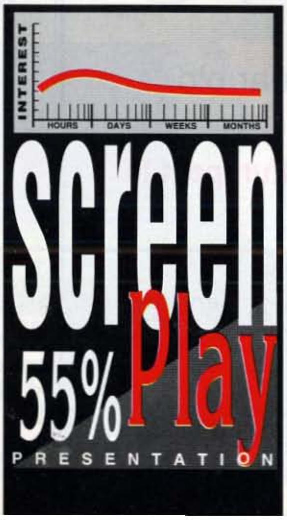
The only problem is that the gameplay is fairly basic – it's not stupidly simple but it takes about as much strategic planning as tying your shoelaces. At first, this is no bad thing as it makes the game easy to pick up and play. The problem comes after a few hours. You will either be saying *What's the point?* or be so engrossed that you'll have lost the ability to talk.

If you are after a fun game that returns you to the *traditional arcade values* this is the one. A very promising piece of codemanship from The Soft Lads, and I look forward to their future releases.

Ben Reilly



Grievous Bodily 'Arm



...guilty as charged

Price: £24.95
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Requirements: Risc OS

I LIKE mindless violence as much as the next psychopath so the idea of wandering along, beating up muggers and knocking out leather-clad chicks got me fairly excited. A beat 'em-up? On the Arc? Well, knock me off a yacht...

The City – Wellyn Garden? – has been overcome by groups of crazies under the influence of a new superdrug. Your job is to fight your way through the hordes, finally reaching the warehouse where the drugs are made. Then all you have to do is *negotiate* with the evil scientist who invented it.

Right, no messing, this game is useless. If it were an international cricket team it would be Zimbabwe.

If it were a Formula One racing car, it would have to stop after its first lap because everyone else had finished and gone home. It's that bad. The graphics are lacklustre with very poorly detailed sprites and even worse backgrounds.

Not a hint of parallax. Do you remember those LCD games, like Donkey Kong? GBA's got about as many frames of animation – not a lot.

The music is fair, with a few tunes that a least try to sound *hard*. The sound effects are adequate, but they don't blow you away.

Still, the sound and graphics don't really matter if the game is awesomely playable. Unfortunately this one doesn't cut it in any department.

Most of the skill involves avoiding manhole covers that tend to leap into the air or flames that sometimes spray out of a canister. There are a few baddies to beat up – except it's more like: Wait-for-them-to-get-close-and-then-punch up. You can only punch and do a flying kick. Nothing else.

This is such a let down. I couldn't bear to play it for more than 10 minutes at a time. What is the point in releasing a game like this? They only serve to embarrass Archimedes owners. If you are a beat-'em-up fan and insist on buying this, try it first. I'm sorry Fourth Dimension, but this is not even worth the disc it's on.

Ben Reilly

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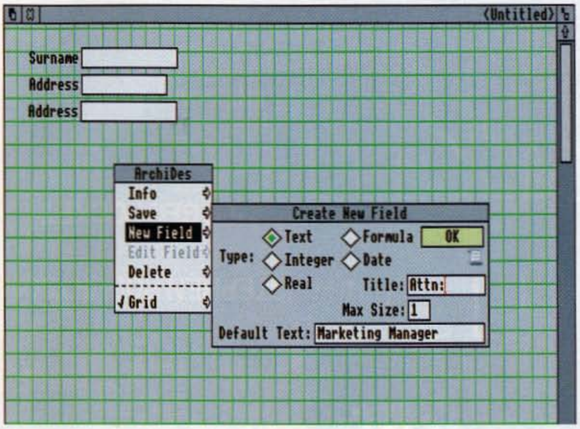
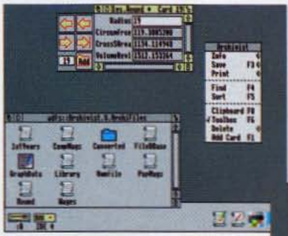


Surname
Address
Address

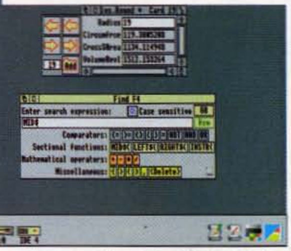
Type: ◆ Text ◇ Formula ◇ Integer ◇ Date ◇ Real
Title: Attn:
Max Size: 1
Default Text: Marketing Manager

Easy to design with a useful default option



Toolbox is intuitive and easy to follow

Product: Archivist
Price: £24.95
Supplier: Oregan Developments, 36 Grosvenor Avenue, Streetly, Sutton Coldfield B74 3PE.
Requirements: Risc OS



Powerful but friendly searches

Searching the files

Do you get lost in paperwork? Phil Tayler checks out Archivist

ARCHIVIST sets out to be a professional but low-cost data management system and it certainly does have a power and range of options which puts it at the top of it's class.

It's a database that you can design and into which you can enter information about any subject and then search it. What makes it stand out from the crowd is the way in which the data is searched and manipulated.

There are two programs: ArchiDes and Archivist. The former is the designer program used to set up a new datafile, while Archivist interrogates and sorts the entries.

Once loaded, ArchiDes presents a rather dull-looking grey box. You create a number of fields each selected as holding text, dates or numerical values. The date format is selectable so you have limited control over how it is entered. The numeric values can be real or integers, and a really powerful option allows you to include a formula.

For example, if two fields were used for the fuel used by various vehicles and the mileage recorded by each, the formula field could automatically calculate the number of miles per gallon for each vehicle, which is similar in style to a spreadsheet function.

Surprisingly, you also have to define the field length. Default text can be defined if required, should there be a *normal* response for a particular field. This can be useful if you want to have a particular town as the default entry for the majority of users. This can be overwritten if needed though.

Filling the blanks

The field blanks are easily dragged around in the box which can be scaled to fit tidily on to the desktop, with the design being saved for future use. Any details of the fields can be altered later if you want.

Data is entered via the Archivist program. This follows a fairly standard format, with the text fitting into the pre-designed boxes. These records can then be sorted by any fields and a useful facility provides both a primary and secondary sort. For instance, several records sharing a surname could be sorted by their first names.

A number of fonts can be used in this display and adding extra cards is simple – just select the icon. The records can be saved in CSV format for use with other programs, by identifying two fields for the axes.

Interrogating the database is most unusual and not particularly easy, as the program does not provide prompts. Instead you have to enter the kind of formula which I haven't had to use for some time and the syntax is quite precise. To search for sales greater than 500, you must type:

```
[Sales]>{500}
```

To search on a line beginning with B you must enter:

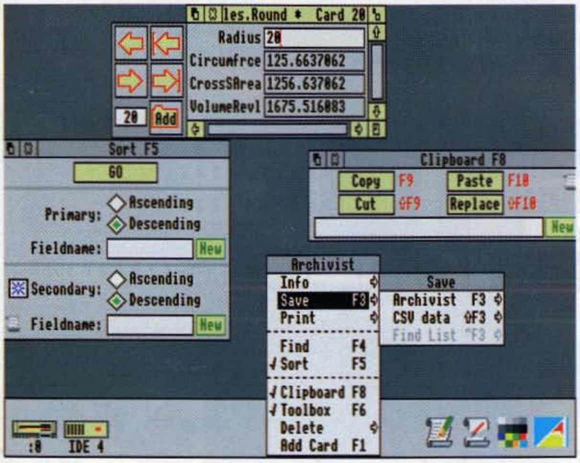
```
LET$([Address:],1)={B}
```

which does not rate highly in my definition of user-friendliness.

Though the typing is reduced as you click on the phrases and symbols required, this area is the fatal flaw for this piece of software as it doesn't use the power of the Archimedes to show a friendly face. Surely the messages on screen could have been simple, while the program code resorted to MID$ and so on, but out

Summing up

The program's features do actually allow very powerful searches and these can of course be combined using AND and OR. It is directed towards older students or home use, but I'm not convinced that the benefits of power and low cost outweigh the unfriendly interface.

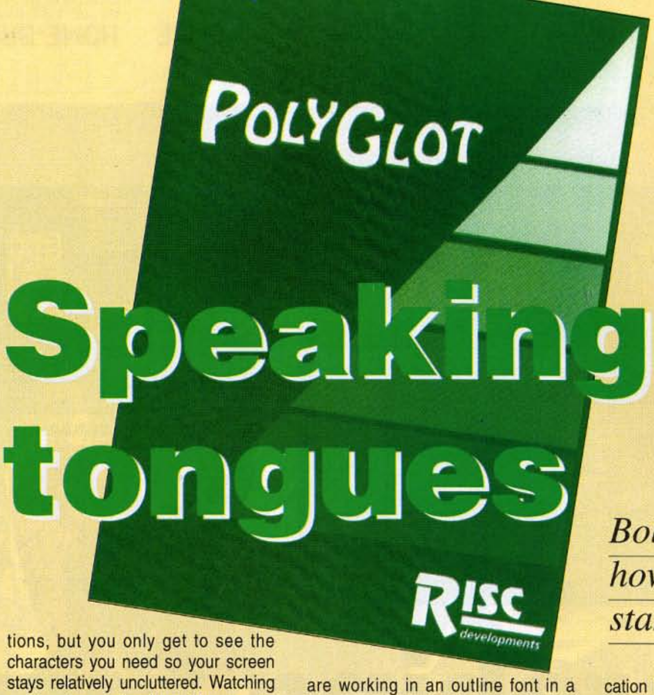


Radius 20
Circumfrce 125.6637062
CrossSArea 1256.637062
VolumeRevl 1675.516083
20

60
Primary: ◇ Ascending ◆ Descending
Fieldname:
Secondary: ◇ Ascending ◆ Descending
Fieldname:

Nice compact windows

Product: PolyGlot
Price: £14.95
Supplier: Risc Developments, 117 Hatfield Road, St Albans, Herts AL1 4JS.
Tel: 0272 40303
Requirements: Risc OS



Speaking in tongues

Bob Harding sees how PolyGlot stands up

I LIKE computers and I expect you do too. There is, however, a group of cranks out there who only want to use a computer to produce work in one form or another.

These, let's call them *normal people*, are quite happy to switch on a computer, word process a letter, print it then switch the computer off again without delving around the system until 1.30 am. Odd but true.

When I do manage to produce a letter I like to get it just right. I am not happy with typing 1/2 for example, it has to be ½ even if I have to create a draw file to do it. Then I discovered that I could get this result by holding down Alt and typing 189 on the keypad, it's so easy. Of course it is a little difficult to remember all those Alt numbers.

Good character

Then along came a couple of public domain utilities such as !Chars2. These allowed complete access to any currently loaded font. Being a school teacher I found I could observe quite a few of the *normal people* and I noticed that, despite creating quite a few sheets of foreign text, very few actually could be bothered with sifting through 256 different characters to get to the few they actually needed. Enter !PolyGlot.

Within seconds it's obvious that this application was designed to enable the entry of non-keyboard characters on to the screen, for instance putting foreign characters into a word processed document.

Once loaded, !PolyGlot sits on the icon bar and waits for you to select Menu which has the normal Info and Quit options, but also one called Languages. This leads to French, German and Symbols – but many more can be simply added to this list.

Selecting French opens a window containing a range of 20 letters with a range of accents – grave, acute, cedilla and so on.

These appear in the normal system font though they can be made double size with a simple menu selection. The same applies to German or Symbols though, of course, the letters displayed are different. Very easy, very neat and very effective. In many ways !PolyGlot is like the PD applications, but you only get to see the characters you need so your screen stays relatively uncluttered. Watching pupils at my school use it was very interesting. Some had been using the PD programs – though most couldn't be bothered – but within a very short time most had changed to !PolyGlot.

On the disc with !PolyGlot came !PGCustom, an application that enabled me to change !Polyglot in almost any way I wanted. It was very easy to add another country to the menu list or to change the characters displayed once a country's window was opened.

Now the grumbles. It may be personal and I know that a polyglot is someone who can speak a lot of languages, but I hate the name. The program enables you to enter non-keyboard characters, accents, symbols and the like, so why not !Accents or !MoreKeys or !Foreign or something that the average mortal can understand.

One potential problem is that the !PolyGlot display is always of the System font – a feature that I actually like because it keeps it simple. If you are working in an outline font in a word processing document the definition of the character may not be the same as the system font and you'll get odd results.

To be fair it should be fine for most well designed fonts, but I can foresee problems with some PD fonts as well as for fonts like Greek and Dingbats which will be totally wrong.

Invisibility

I understand that there is some guidance from Acorn that says you should not put the command IconSprites <Obey$Dir>.!Sprites in the !Run file.

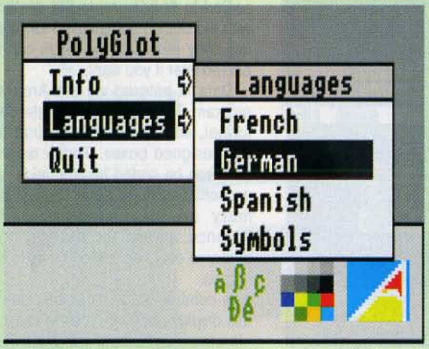
Risc Developments have stuck to this with the result that if !PolyGlot is installed on a hard disc or network and then loaded automatically from a menu-based program like Menon, no icon appears on the icon bar – though the program still works. Easily rectified but annoying.

One option in the PGConfig application is to redefine the keyboard. It looks like it only affects one definition, but it actually affects them all and should be used with great care. I would like to see this option made clearer.

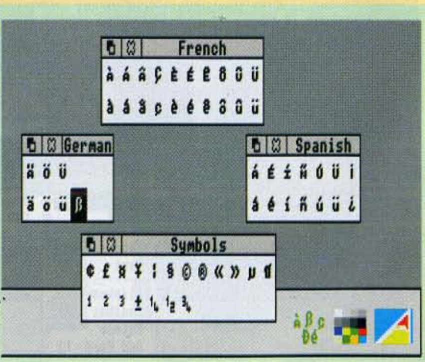
Summing up

If you simply want to put foreign characters into your work – DTP, word processing, datafiles, Genesis and so on – this is great, buy it. I would think that it is a must for schools where ease of access is important.

But, if you want to have access to the whole range of font characters, stay with the PD programs. Personally I want access to both but !PolyGlot will be used far more. At £14.95 it is not cheap for something that almost exists on the public domain but it is easily affordable and I hope that this includes a site licence fee for schools otherwise it could be back to PD for us.



The choice of languages can be extended



Only the characters needed are displayed

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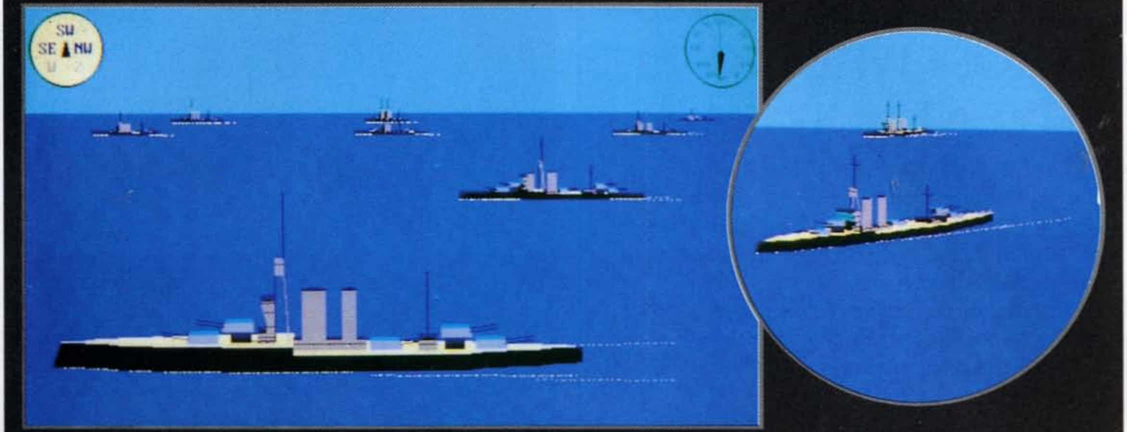

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Synthetic sound

Steve Turnbull explores the ins and outs of new sample-creating package

Product: SFXM
Price: £39.95
Supplier: Cambridge International Software Ltd., Suite 2A, 436 Essex Road, London N1 3QP
Tel: 071-226 3340

BACK in the bad old days of electronic keyboard synthesisers the enthusiastic musician had to wire different circuits together by plugging connectors into a patchboard.

Nowadays synths are much more friendly and samplers are becoming more prevalent, so what are CIS doing with Sound Effects Maker?

SFXM is effectively an implementation of the old-style synthesiser. You join various component circuits – oscillators, ramp generators, sample and hold circuits, filters and so on – and the resultant sound can be played. But there are differences.

For a start you have an effectively limitless supply of components and if you want 30 oscillators you can have them. The interface is graphical so you can drag the components around in the window and group them as you want. Connections are made by clicking on the connection tool and then selecting an output and an input between the various devices.

Unlike the original synthesisers the sound isn't played immediately, instead a *sample* is created and this can be saved in numerous different formats for use in other programs. So, for example, you can create an electric guitar sound, save it as an Armadeus sample and use the editing facilities of that program.

Strictly speaking SFXM isn't one program, it's two: SFXM itself deals with the components and calculates the points of the sample. SFXED is a comprehensive sample editor from which you can make changes in the sound, add echos, fade in, fade out and so on, and save the result in a multiplicity of formats.

When you receive the system you must first install it using the program provided. This requires you to enter your name and it displays this with your licence number when the program starts up.

Provided with the programs are 25 sound effects like a howling wind, drips, echos and lasers, plus 60 musical instrument sounds. These allow you to see how the components can be joined and you can experiment to see what changing various parameters does to the resulting sound.

There's a definite urge, when you start working with this program, to bung a whole load of components down and see what comes out at the end.

This temptation needs to be resisted because even assuming you get any sound at all it will almost certainly be like the typical synthesiser sound of the late 60s and early 70s.

The system does require thought and patience – there's little point throwing in an oscillator without connecting it to a constant voltage generator, or perhaps a slow ramp. High and low pass filters have to be used with care, but they're essential for producing interesting tonal qualities. Throwing signals into an adder is all very well but if the maximum volume is exceeded you just get distortion.

To use the program to the full you should start with a simple oscillator and apply different modifications to it one component at a time just to see what each one can do.

The heart of any circuit, or sheet as it's called, are the oscillators – you'll always have at least one. These can generate a number of different waveforms – the default is the sine wave – but you can have triangular (sawtooth), ramp, square, a constant value or random ones. Alternatively you can draw your own wave or alter a standard one by hand.

These waves can then be modified by doubling or halving their frequency, multiplying or dividing the amplitude by two or phase shifting by plus or minus 90 degrees. Any of these options can be repeated again and again but as the wave has only 256 discrete values there's a limit to what can be done.

Hand editing these waves – and any other window containing discrete values, like the amplitude envelope – is a simple matter of dragging with Select in the window. Unfortunately you can get holes in the drag because of the delayed response in the multi-tasking environment. Dragging with Adjust ensures there are no gaps.

Apart from the optional random wave you can also have a noise generator which produces continuously changing levels. This might not seem useful but all natural sounds contain a random element – it's just important not to get carried away. In fact a reasonable tone can be produced running one of these through a filter.

The sample produced by the sheet will have a constant volume unless it's modified by an envelope generator. By running the final signal through this you can alter the attack and sustain features of the sound. A drag window is presented with 1,024 values that can be used to scale the sound.

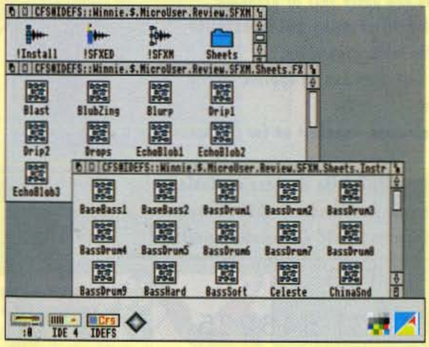
Most components have two inputs: One takes the incoming sound to be processed and the other is a control which affects how the sound is processed – usually a constant level signal or a slow wave is applied to the control. However there's no reason why a sound from one oscillator can't be used as a control but it takes a lot of experimentation and practice to know what you're aiming for.

Perhaps the most exciting feature of the software is the ability to take an input from an external source. It doesn't work in real-time so the source is a data file probably containing another sample.

So, for example, you could take a sample of your voice, then process it through SFXM to make it sound different – put together a couple of ring modulators and you'll get a Dalek sound.

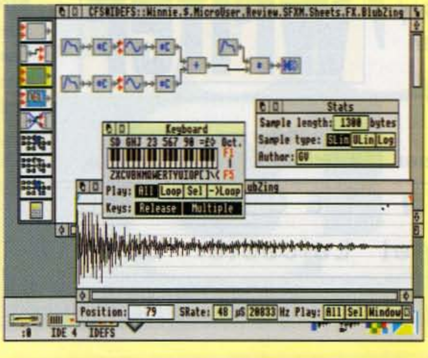
Summing up

This is a very interesting product that allows you to create both natural or unnatural sounds easily and its results are excellent. From an educational viewpoint it certainly shows how waves can be modified to produce different types of sound. This is definitely worth a look.



SFXM and some of its prepared files

Created samples can be played from the keyboard



Sample length: 1300 bytes
Sample type: SLin ULin Log
Author: GV
Play: All Loop Sel ->Loop
Keys: Release Multiple
Position: 79 SRate: 48 µS 20833 Hz Play: All Sel Window

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Mastering the basics

Martin Reed tries out a new way to file his Master 512

THE Master 512 co-processor was Acorn's pre-Archimedes attempt to bridge the gap between the Acorn-dominated world of education and the world of business, where the IBM PC is king.

Although the 512 system is no longer in production by Acorn, it is by no means dead and buried. On the contrary, a dedicated band of companies are continuing to provide support and new products for the system, ensuring its continued survival and growth.

One such is Essential Software, who have a number of excellent products that will interest many 512 users. The flagship of their range is CPFS – the Co-Processor Filing System – or the CPFS+ which comes with a printer buffer. This add-on uses the memory of a fitted – but inactive – Master 512 co-processor board as a ram disc.

To those unfamiliar with the term, a ram disc is an area of memory that acts as an additional disc drive, in the same way that the system might have a physical 5.25in or 3.5in disc drive.

A ram disc does not provide permanent storage because its contents are lost when the computer is switched off, but because it has no moving parts it is incredibly fast. It is also considerably cheaper than a hard disc, which is a point not to be dismissed lightly.

My first BBC Micro was an Issue 4 Model B with a single-sided 40-track disc drive, because that was the only disc storage system I could afford at the time. I quickly realised the difficulty of backing-up my data with just a single drive, so for this reason and others I expanded my system with 128k of sideways ram.

This could be configured as a ram disc of a size sufficient to swallow the entire contents of a 100k disc, and spit it out again on to a backup disc. It was an ideal solution to my immediate problem but with the advent of disc systems with higher capacities the uses of a ram disc of such a size quickly became limited.

However, its uses for rapid manipulation of data, such as sorting database files, remain as strong as ever. What better way, therefore, to speed up your rate of data processing, than to utilise the otherwise dormant half-megabyte of the 512 co-processor?

Apart from the Master 512 co-processor itself, the CPFS system consists of a single 16k sideways rom, which can be installed into one of the conventional sideways rom sockets, or a rom cartridge. Once the rom has been installed, just type *CPFS to select the Co-Processor Filing System.

It operates in a manner very similar to the Acorn DFS, and responds to a similar range of commands. *COPY, *DIR, *WIPE, *RENAME – all its operational commands will be familiar to DFS users.

Its directory structure is identical to that of the Acorn DFS, in that each file can be given a single-letter directory prefix, but it is not a hierarchical system like the ADFS. However, as the use of a ram disc is purely for temporary storage, this is hardly a problem. CPFS has a number of enhancements over both the Acorn DFS and ADFS. It allows a total of 127 files to be stored – subject of course to the capacity of the disc and the size of the files.

The command *COMPACT is recognised by the filing system, but this command will rarely be used because the CPFS automatically reorganises the files so that all free space is at the end.

It also provides a new command *TRANSFER which allows files to be transferred quickly and easily between different filing systems – CPFS and DFS, CPFS and ADFS, CPFS and Econet, even between two non-CPFS filing systems such as DFS and ADFS.

The Co-Processor Filing System has been designed in such a way that from the average user's point of view its operation is effectively identical to the operation of, say, DFS or ADFS. Consequently, anyone familiar with the other filing systems will be immediately familiar with CPFS.

Equally, the machine code programmer will also find that all operations can be performed from machine code just as easily as with the physical disc-based filing systems.

If your primary use for a ram disc would be for making backups on a single-drive disc system, the memory of an unexpanded 512 board is insufficient to back-up a *normal* 640k double-sided, 80-track ADFS L disc.

However, it will happily back-up all types of DFS disc and all other capacities of ADFS disc usable on the 8-bit machines. Moreover, there are now a number of companies offering ram upgrades to 764k, 896k or even 1024k – one megabyte.

Summing up

In my opinion, a memory expansion for the 512 board should be high on every 512 user's list of priorities for their computer system. Not only does it allow CPFS to configure the 512's memory as a larger ram disc, but it also greatly increases the range of software that will run on the system.

Many modern software packages, such as desktop publishing systems, require the machine to be fitted with a minimum of 640k of random access memory, so such an expansion immediately elevates the Master 512 system to a more *serious* level.

If you do not use a database to any serious degree and already run a twin-floppy or hard disc system, a ram disc will not offer many benefits over the system as it stands. On the other hand, if you already own a Master 512 co-processor and have even the occasional use for a ram disc, CPFS is an excellent system that will greatly increase the efficiency of a Model B or Master system.

Moreover, if you make serious use of a database system such as Viewstore or my own choice of Inter-Base, the speed and flexibility of this system will pay for itself in no time – don't pass it by.

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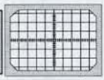

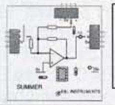

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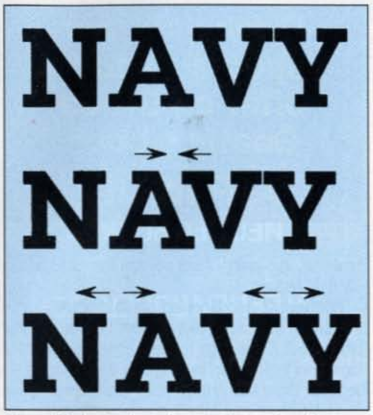
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Figure I: Using kerning to improve the spacing of letters

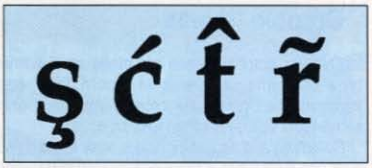

Figure II: Some custom-built accented letters

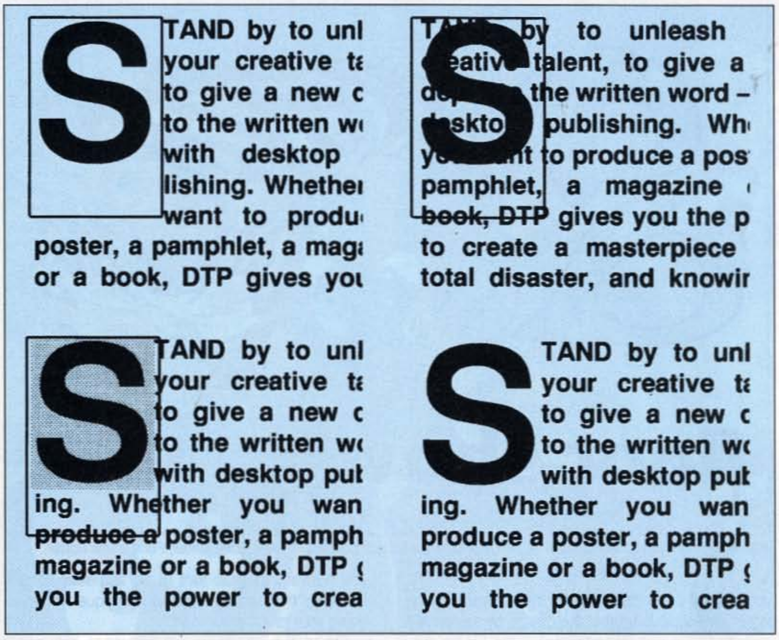
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Figure III: Stages in creating a dropped capital, showing where the frames go. First a frame for the captital, then made transparent and non-repelling, then a second frame behind it (shaded) to repel the text, and lastly the finished product

Text – angled and mangled

KEY TIP

Whatever reason for using distorted text, use such tricks sparingly.

BEFORE looking at how text can be modified to produce special effects, let's consider a couple of further subtle ways to give your work a more professional finish. Look at Figure I – the word NAVY appears in three slightly different forms.

The first is just as it was typed and the A and the V look too far apart. To get round this problem, which usually only arises with headline-sized letters, you need to use kerning.

Kerning is the technical term for nudging letters slightly together or apart to even up the overall appearance. With Risc OS 2 there's no automatic way of doing this – you have to do it by hand and judge it by eye. The letters in the second and third samples in Figure I look more evenly spaced, but two of the letters in the former were kerned together with Impression's Control+E shortcut and in the latter some were kerned apart with Control+R. Each solution has its place.

You can also raise or lower letters individually, in Impression with Control+U and Control+J respectively. An extreme use of both horizontal and vertical kerning is shown in Figure II, where accents have been added manually to letters for obscure or non-existent languages.

The second nicety is the use of character number 160 – it's just a space but it's a special sort of space. Your DTP software treats it simply as an ordinary letter even though you see it as a space when printed.

As a result, it acts as a fixed space, one that isn't used in justifying a line or for signifying the end of a word. Use a fixed space – Alt+Space usually does the trick – instead of an ordinary space in telephone numbers or large numbers such as 46 000 to stop them from being split over a line.

Dropping letters

The first letter of this and all articles in *The Micro User* is a *dropped capital*. This is the textual equivalent of waving your arms to attract attention. If you have been following this series you will know all the techniques needed to create a dropped capital for yourself from Figure III and the hints in the next few paragraphs, while you use the Impression Junior software on the demonstration disc. First you need your basic text. Then delete the first letter because you will be putting it in a frame of its own.

Next use Control+I to make a frame big enough to hold the large capital letter – but see the top left of Figure III, where I've given the frame in question a border to make it show up. Notice how much bigger the frame has to be than the letter itself. You'll need to use the Effects submenu to get the letter the right size by trial and error.

To make the text flow neatly round the letter you will have to use a different frame to repel the surrounding text. First make the letter's frame transparent and non-repelling of text by using the Alter frame dialogue box, which you can reach with Ctrl-F10. You should end up with something like the top right of the figure, without the frame border of course.

Now simply make a new frame the exact size to repel the text from the letter – but the large capital disappears too. This is because the stacking order is wrong and the letter has been repelled by the new frame.

There's no point in making the frame non-repelling, because that's what it's there for. Instead

➤

> *Only a little work can make your text unreadable, so consider your readers and take care.*

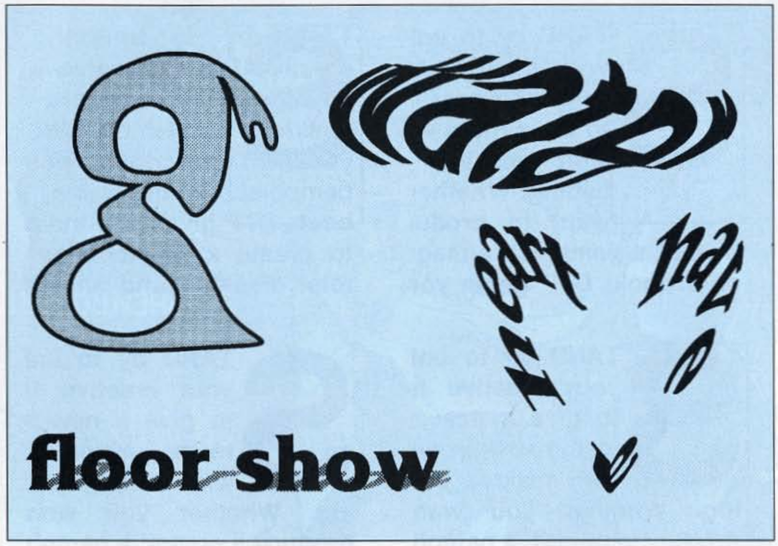

Figure IV: A few simple examples of text in Draw format after manipulation in Draw, DrawBender, FontFX and Poster

you need to bring the dropped capital's frame to the top of the stack, in front of the others, by selecting it and then choosing Bring to front in the Frame submenu. The bottom left of the figure shows how the frames – one bordered and one tinted for clarity – fit together to produce the effect at the bottom right.

Graphical text

So far we have considered text only as text – but it can also be treated as graphics in the right circumstances, to brighten up your page. If you've ever tried putting text into the Risc OS 2 version of Draw you will know that you can't rotate it or alter its colour with that application. Until Risc OS 3 is more widely available we must use intermediary software to make text objects behave as graphical objects.

Plenty of software exists to do this. The full range is too large to list here, but worthy of note are FontDraw – which comes free with Impression, DrawPlus from various public domain sources, FontFX from The Data Shop, DrawBender from Ian Copestake, Poster from 4Mation and ArtWorks from Computer Concepts.

Once you have the text as a graphic object you can manipulate it in Draw, just as you can modify any other Draw file. Figure IV shows at the top left a tired-looking letter g whose shape was edited in this way.

You can also duplicate it and modify the copies in different ways, and many of the facilities in the other software make use of this. The bottom of Figure IV gives simple examples of what can be done with FontFX by adding shadows and with Poster by pouring it from one mould shape into another. Poster can do the same for any Draw file.

DrawBender does much the same thing for text but in a different way, as the top right of Figure IV demonstrates. FontFX is useful if you want to make a sloping font out of one that you only have in an upright version – see Figure V – but remember that you can't create a true italic font in this way, nor can you convert an italic font to an authentic roman. However, this can be a useful technique for broadening your range of fonts.

Figure V also shows the difference between a true italic font and an oblique or sloping one, by comparing Italian Book roman and italic with a sloped version of the roman and a backsloped version of the italic. Notice especially the difference in shape of the small letter *a* and the fact that different italic letters have different slopes and so they don't convert accurately to upright.

By contrast, if you try this with Homerton, for instance, you'll find that the letter shapes in the upright and oblique fonts can be more or less converted from one to the other by sloping them.

Using the facilities provided by these text-modifying applications, only a little work can make any word almost unreadable, so consider your readers and take care. After all, the whole point of using words is to let people read them.

The resulting modified or mangled text object can be included in your document by dropping it into a graphic frame. You may want to use the item as a headline, illustration, focal point of the page or simply to fill space.

Check out our special reader offer on Bruce Goatly's book *DTP for All*

We haven't encountered graphic frames yet in this series and they'll play a more central role next month, but it's enough to know that they're simply formed in Impression by dragging a graphic file – a sprite or Draw file – into a newly created frame. You can't later put text into a graphic frame nor vice versa.

Graphic frames

In Ovation, graphic frames are made as a distinct type of frame, whereas in Acorn DTP and Impression all frames are created equal and only subsequent use determines their type.

Stretching and squashing text is easy if you do so after converting it to a Draw object. This is because Impression's Lock aspect option icon in the Alter graphic dialogue box – which you can reach from the Frame submenu or by double-clicking on the relevant graphic frame – can be turned off to let you fill the frame, whatever its proportions, with it. Extended text can look squashed, as though it has been sat on, or stretched from the ends – it all depends on context.

Another use for text as a Draw object is to simplify making a dropped capital, because you can just make the frame for the capital more or less the size you want and then drop the letter into it direct from the FontDraw or FontFX Save dialogue box. Adjusting the frame and the capital to the exact size you want is then easy.

● *Next month we'll be looking into where you can get graphics from and how to use them in your documents.*

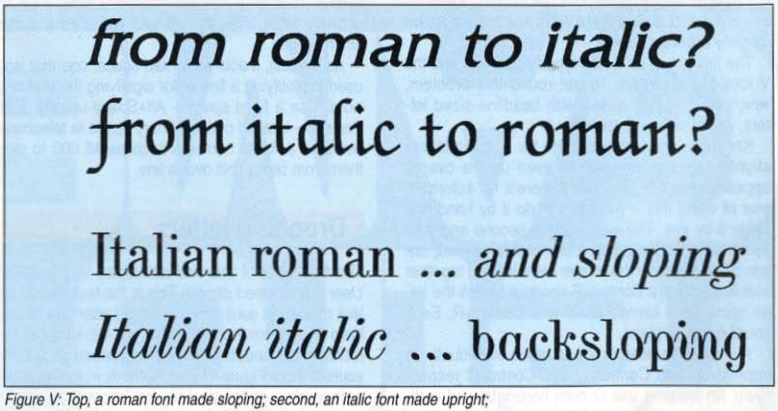
from roman to italic?
from italic to roman?
Italian roman ... and sloping
Italian italic ... backsloping

Figure V: Top, a roman font made sloping; second, an italic font made upright; third and fourth, comparing true italics with sloping roman and vice versa

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Hewlett Packard Quietjet 80 Col	£399.00
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* Phone for Upgrades for the original BBC Model B etc

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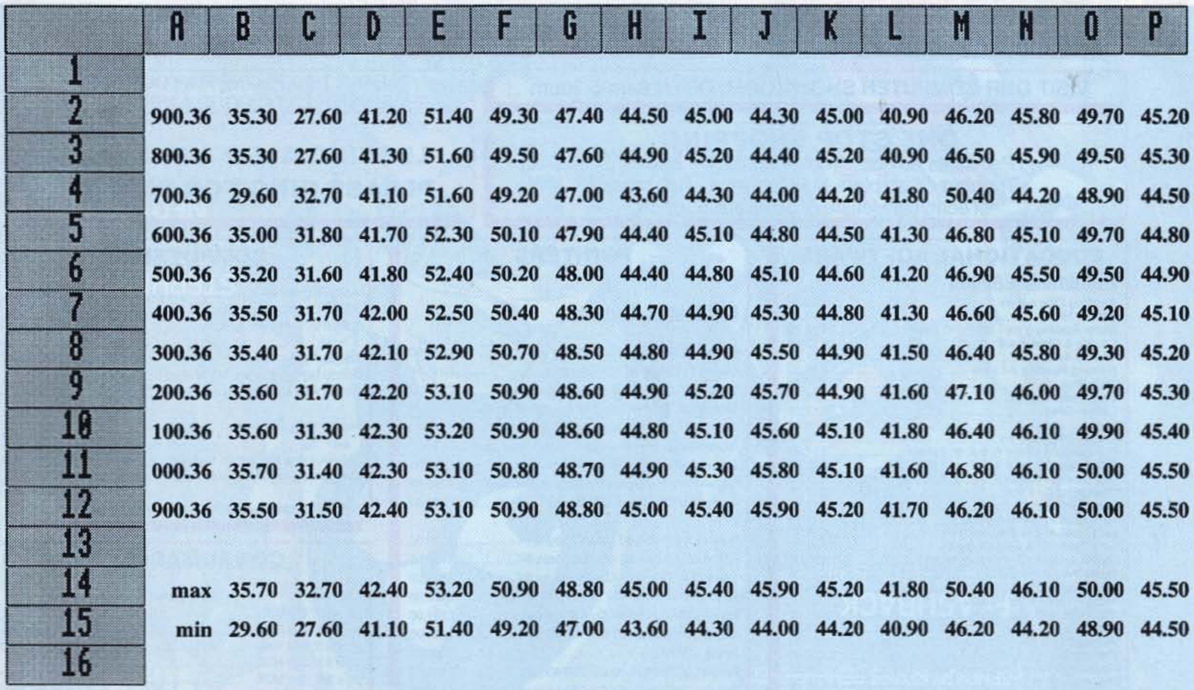
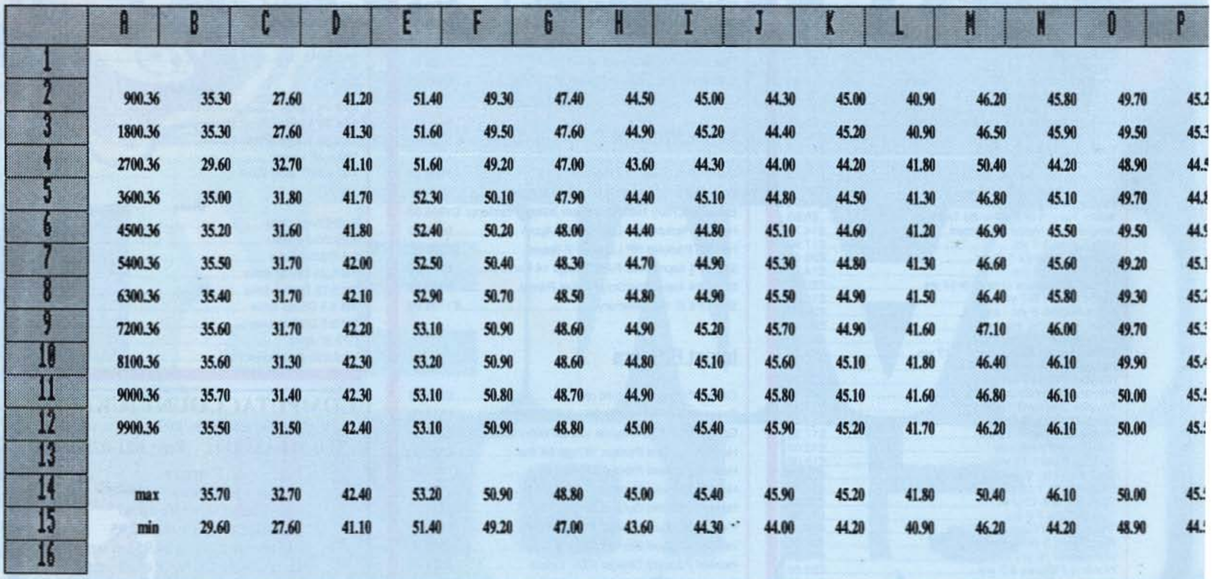


	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2	900.36	35.30	27.60	41.20	51.40	49.30	47.40	44.50	45.00	44.30	45.00	40.90	46.20	45.80	49.70	45.20
3	800.36	35.30	27.60	41.30	51.60	49.50	47.60	44.90	45.20	44.40	45.20	40.90	46.50	45.90	49.50	45.30
4	700.36	29.60	32.70	41.10	51.60	49.20	47.00	43.60	44.30	44.00	44.20	41.80	50.40	44.20	48.90	44.50
5	600.36	35.00	31.80	41.70	52.30	50.10	47.90	44.40	45.10	44.80	44.50	41.30	46.80	45.10	49.70	44.80
6	500.36	35.20	31.60	41.80	52.40	50.20	48.00	44.40	44.80	45.10	44.60	41.20	46.90	45.50	49.50	44.90
7	400.36	35.50	31.70	42.00	52.50	50.40	48.30	44.70	44.90	45.30	44.80	41.30	46.60	45.60	49.20	45.10
8	300.36	35.40	31.70	42.10	52.90	50.70	48.50	44.80	44.90	45.50	44.90	41.50	46.40	45.80	49.30	45.20
9	200.36	35.60	31.70	42.20	53.10	50.90	48.60	44.90	45.20	45.70	44.90	41.60	47.10	46.00	49.70	45.30
10	100.36	35.60	31.30	42.30	53.20	50.90	48.60	44.80	45.10	45.60	45.10	41.80	46.40	46.10	49.90	45.40
11	000.36	35.70	31.40	42.30	53.10	50.80	48.70	44.90	45.30	45.80	45.10	41.60	46.80	46.10	50.00	45.50
12	900.36	35.50	31.50	42.40	53.10	50.90	48.80	45.00	45.40	45.90	45.20	41.70	46.20	46.10	50.00	45.50
13																
14	max	35.70	32.70	42.40	53.20	50.90	48.80	45.00	45.40	45.90	45.20	41.80	50.40	46.10	50.00	45.50
15	min	29.60	27.60	41.10	51.40	49.20	47.00	43.60	44.30	44.00	44.20	40.90	46.20	44.20	48.90	44.50
16																

Figure I: Too big a font can make figures disappear

Empirically speaking



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2	900.36	35.30	27.60	41.20	51.40	49.30	47.40	44.50	45.00	44.30	45.00	40.90	46.20	45.80	49.70	45.2
3	1800.36	35.30	27.60	41.30	51.60	49.50	47.60	44.90	45.20	44.40	45.20	40.90	46.50	45.90	49.50	45.3
4	2700.36	29.60	32.70	41.10	51.60	49.20	47.00	43.60	44.30	44.00	44.20	41.80	50.40	44.20	48.90	44.5
5	3600.36	35.00	31.80	41.70	52.30	50.10	47.90	44.40	45.10	44.80	44.50	41.30	46.80	45.10	49.70	44.8
6	4500.36	35.20	31.60	41.80	52.40	50.20	48.00	44.40	44.80	45.10	44.60	41.20	46.90	45.50	49.50	44.9
7	5400.36	35.50	31.70	42.00	52.50	50.40	48.30	44.70	44.90	45.30	44.80	41.30	46.60	45.60	49.20	45.1
8	6300.36	35.40	31.70	42.10	52.90	50.70	48.50	44.80	44.90	45.50	44.90	41.50	46.40	45.80	49.30	45.2
9	7200.36	35.60	31.70	42.20	53.10	50.90	48.60	44.90	45.20	45.70	44.90	41.60	47.10	46.00	49.70	45.3
10	8100.36	35.60	31.30	42.30	53.20	50.90	48.60	44.80	45.10	45.60	45.10	41.80	46.40	46.10	49.90	45.4
11	9000.36	35.70	31.40	42.30	53.10	50.80	48.70	44.90	45.30	45.80	45.10	41.60	46.80	46.10	50.00	45.5
12	9900.36	35.50	31.50	42.40	53.10	50.90	48.80	45.00	45.40	45.90	45.20	41.70	46.20	46.10	50.00	45.5
13																
14	max	35.70	32.70	42.40	53.20	50.90	48.80	45.00	45.40	45.90	45.20	41.80	50.40	46.10	50.00	45.5
15	min	29.60	27.60	41.10	51.40	49.20	47.00	43.60	44.30	44.00	44.20	40.90	46.20	44.20	48.90	44.5
16																

Figure II: Reducing the font size makes it fit

Barry Mallett continues with his analysis of spreadsheet creativity

WHILE you are creating a spreadsheet one of the most common, and frustrating, problems is that shown in Figure I. Here you have entered all the data, and one cell in a particular column is slightly too long for the selected width.

Usually you do not notice this until you have printed it out and you have already given it to someone like your boss who immediately sees it.

A feature that would be very useful here would be a method by which the spreadsheet could adjust all column and rows to accommodate the widest need. Alas this is not available in any of the packages I have come across, but Schema does offer an easy way of adjustment to make them fit.

If you carefully move the cursor to the line between the A and B column markers you'll see that the pointer changes to a left/right arrow. If you now hold down Select and drag the mouse to the right you will notice that the column grows. Similarly you can move the mouse to the left and the column will reduce.

Adjusting the row heights is done in a similar manner except that you move the cursor to the line between the 1 and 2, row markers, for instance. An up/down arrow will appear and adjustment is then made by moving the mouse up to reduce and down to increase the row height.

One other very useful feature that Schema has in its arsenal is for times when you have tables of figures like those in Figure II. All the columns are the same width, but there is a lot of white space between them. How can you empirically adjust the width of all columns together while watching for the most presentable information?

If you click Select on the empty box in the top-left corner – above the row 2 and to the left of the column A markers – you'll highlight the whole spreadsheet. Now move the cursor to the line between A and B column markers until you have the right and left arrows. Now hold down the adjust button and move the mouse to the left or right. All the columns are adjusted at the same time and all columns end up the same width.

Changing the sheet size

Whenever you click Select on the Schema icon on the icon bar you create a new spreadsheet of a particular size, the number of rows and columns that you set up during the configuration of Schema for your particular machine/needs. If you wish to change this you do not have to re-configure the whole thing.

Using the mouse Menu button on the Schema icon brings up a menu list which includes Default size. From this you can set up the number of rows and columns each new spreadsheet will have whenever you select the Schema icon.

The more usual method is to add new columns by simply selecting a particular column and then Menu-Selection-Columns-Add column(s) and inserting the number of new columns you require. All new columns are inserted to the right of the selected column. New rows are added in a similar way by selecting a row and Menu-Selection-Rows-Add row(s) and these are added below the highlighted row.

For deleting you should highlight the particular rows/columns you wish to delete and then Menu-Selection-Rows-Delete rows and then click select.If you have formulae in your spreadsheet remember that many of the references may change when you add or delete rows or columns. This should not be a problem as all spreadsheets usually make allowances for this automatically.

However, you may have called up some absolute references which have changed so I always check some of the formulae to make sure they are still doing what I expect, otherwise you can get some very confusing answers.

● *In the next section we will be going through some of the ways that spreadsheets can be exported and imported between different applications.*

Inserting and deleting rows and columns

For example, take the following spreadsheet:

```
|      |   A    |   B    |   C    |   D    |   E    |   F    |   G    |   H    |
|======|========|========|========|========|========|========|========|========|
|    1 |    1.00|    2.00|    3.00|    4.00|    5.00|    6.00|    7.00|    8.00|
|    2 |    2.00|    3.00|    4.00|    5.00|    6.00|    7.00|    8.00|    9.00|
|    3 |    3.00|    4.00|    5.00|    6.00|    7.00|    8.00|    9.00|   10.00|
|    4 |    4.00|    5.00|    6.00|    7.00|    8.00|    9.00|   10.00|   11.00|
|    5 |    5.00|    6.00|    7.00|    8.00|    9.00|   10.00|   11.00|   12.00|
|    6 |    6.00|    7.00|    8.00|    9.00|   10.00|   11.00|   12.00|   13.00|
|    7 |    7.00|    8.00|    9.00|   10.00|   11.00|   12.00|   13.00|   14.00|
|    8 |    8.00|    9.00|   10.00|   11.00|   12.00|   13.00|   14.00|   15.00|
|    9 |    9.00|   10.00|   11.00|   12.00|   13.00|   14.00|   15.00|   16.00|
|   10 |   10.00|   11.00|   12.00|   13.00|   14.00|   15.00|   16.00|   17.00|
```

The formulae contained within it are:

```
A1:1      B1:A1+1   C1:B1+1   D1:C1+1   E1:D1+1   F1:E1+1    G1:F1+1   H1:G1+1
A2:A1+1   B2:B1+1   C2:C1+1   D2:D1+1   E2:E1+1   F2:@F1+1   G2:G1+1   H2:H1+1
A3:A2+1   B3:B2+1   C3:C2+1   D3:D2+1   E3:E2+1   F3:@F2+1   G3:G2+1   H3:H2+1
A4:A3+1   B4:B3+1   C4:C3+1   D4:D3+1   E4:E3+1   F4:@F3+1   G4:G3+1   H4:H3+1
A5:A4+1   B5:B4+1   C5:C4+1   D5:D4+1   E5:E4+1   F5:@F4+1   G5:G4+1   H5:H4+1
A6:A@5+1  B6:B@5+1  C6:C@5+1  D6:D@5+1  E6:E@5+1  F6:F@5+1   G6:G@5+1  H6:H@5+1
A7:A6+1   B7:B6+1   C7:C6+1   D7:D6+1   E7:E6+1   F7:@F6+1   G7:G6+1   H7:H6+1
A8:A7+1   B8:B7+1   C8:C7+1   D8:D7+1   E8:E7+1   F8:@F7+1   G8:G7+1   H8:H7+1
A9:A8+1   B9:B8+1   C9:C8+1   D9:D8+1   E9:E8+1   F9:@F8+1   G9:G8+1   H9:H8+1
A10:A9+1  B10:B9+1  C10:C9+1  D10:D9+1  E10:E9+1  F10:@F9+1  G10:G9+1  H10:H9+1
```

If we now add a new row below row 5 this is what happens to the formulae:

```
A1:1      B1:A1+1   C1:B1+1   D1:C1+1   E1:D1+1   F1:E1+1    G1:F1+1   H1:G1+1
A2:A1+1   B2:B1+1   C2:C1+1   D2:D1+1   E2:E1+1   F2:@F1+1   G2:G1+1   H2:H1+1
A3:A2+1   B3:B2+1   C3:C2+1   D3:D2+1   E3:E2+1   F3:@F2+1   G3:G2+1   H3:H2+1
A4:A3+1   B4:B3+1   C4:C3+1   D4:D3+1   E4:E3+1   F4:@F3+1   G4:G3+1   H4:H3+1
A5:A4+1   B5:B4+1   C5:C4+1   D5:D4+1   E5:E4+1   F5:@F4+1   G5:G4+1   H5:H4+1
A6        B6        C6        D6        E6        F6         G6        H6
A7:A@5+1  B7:B@5+1  C7:C@5+1  D7:D@5+1  E7:E@5+1  F7:F@5+1   G7:G@5+1  H7:H@5+1
A8:A7+1   B8:B7+1   C8:C7+1   D8:D7+1   E8:E7+1   F8:@F7+1   G8:G7+1   H8:H7+1
A9:A8+1   B9:B8+1   C9:C8+1   D9:D8+1   E9:E8+1   F9:@F8+1   G9:G8+1   H9:H8+1
A10:A9+1  B10:B9+1  C10:C9+1  D10:D9+1  E10:E9+1  F10:@F9+1  G10:G9+1  H10:H9+1
A11:A10+1 B11:B10+1 C11:C10+1 D11:D10+1 E11:E10+1 F11:@F10+1 G11:G10+1 H11:H10+1
```

Rows 1 to 5 are the same and row 6 has nothing in it as this is the new row we have just added. The absolute reference @5 in A7 to H7 is still the same as the absolute reference did not change, while cells A7 to H10 have all changed references by one – cell A10 – which was cell A9 and still contains the result from adding 1 to the cell above it.

Now take the original spreadsheet and delete column E:

```
A1:1      B1:A1+1   C1:B1+1   D1:C1+1   E1:D1+1   F1:E1+1    G1:F1+1   H1:G1+1
A2:A1+1   B2:B1+1   C2:C1+1   D2:D1+1   E2:E1+1   F2:@F1+1   G2:G1+1   H2:H1+1
A3:A2+1   B3:B2+1   C3:C2+1   D3:D2+1   E3:E2+1   F3:@F2+1   G3:G2+1   H3:H2+1
A4:A3+1   B4:B3+1   C4:C3+1   D4:D3+1   E4:E3+1   F4:@F3+1   G4:G3+1   H4:H3+1
A5:A4+1   B5:B4+1   C5:C4+1   D5:D4+1   E5:E4+1   F5:@F4+1   G5:G4+1   H5:H4+1
A6:A@5+1  B6:B@5+1  C6:C@5+1  D6:D@5+1  E6:E@5+1  F6:F@5+1   G6:G@5+1  H6:H@5+1
A7:A6+1   B7:B6+1   C7:C6+1   D7:D6+1   E7:E6+1   F7:@F6+1   G7:G6+1   H7:H6+1
A8:A7+1   B8:B7+1   C8:C7+1   D8:D7+1   E8:E7+1   F8:@F7+1   G8:G7+1   H8:H7+1
A9:A8+1   B9:B8+1   C9:C8+1   D9:D8+1   E9:E8+1   F9:@F8+1   G9:G8+1   H9:H8+1
A10:A9+1  B10:B9+1  C10:C9+1  D10:D9+1  E10:E9+1  F10:@F9+1  G10:G9+1  H10:H9+1
```

Note this time the contents of cell G2. This cell was the old cell reference H2 which had the absolute formula @H1+1. Deleting column E caused the absolute reference to move from H to G and therefore the formula has adjusted to compensate for this.

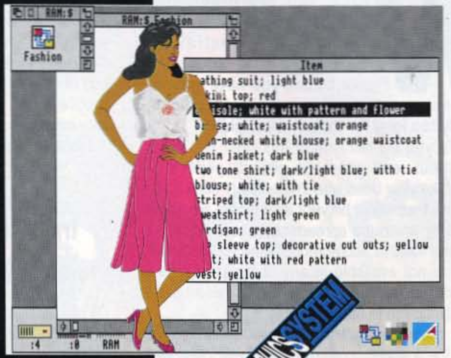
The smArt Suite

All 4Mation packages for the Archimedes carry a FREE SITE LICENCE.

SmArt is a Linked Graphics System. When picture files are loaded into smArt, different parts of the picture can be changed by making selections from a menu. The graphics components are automatically scaled so that the parts always fit. Pictures may be saved as Draw files or transferred to DTP programs or any other applications which can handle Draw files.

The smArt package comes with over two dozen files on subjects ranging from shops to cars, and churches to British Isles maps. Available as separate products are discs of smArt files on specific themes such as Leisure, Heraldry, Faces, Fashion, Homes, Trees & Gardens, and Dinosaurs.

smArt £55 (NZ$ 198)   smArt discs £16 (NZ$ 59)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Fashion
RAM:$.Fashion
Item
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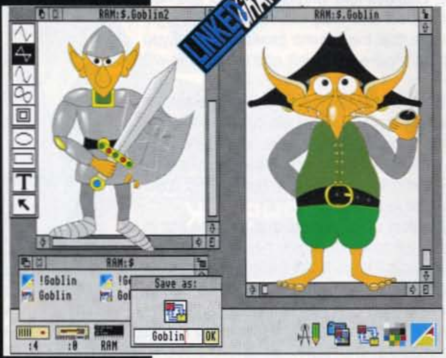
kini top; red
isole; white with pattern and flower
se; white; waistcoat; orange
-necked white blouse; orange waistcoat
denim jacket; dark blue
two tone shirt; dark/light blue; with tie
blouse; white; with tie
striped top; dark/light blue
eatshirt; light green
rdigan; green
sleeve top; decorative cut outs; yellow
t; white with red pattern
vest; yellow
LINKED GRAPHICS SYSTEM

For those wishing to create their own smArt files, smArtFiler is an application which compiles smArt files from your source Draw files. Full instructions are provided along with lots of examples. Individual components may be scaled, rotated, and placed in front of or behind other components. Menu entries may be specified.

If it can be drawn it can be a smArt file.

smArtFiler £35 (NZ$ 129)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!Goblin
Goblin
Save as:
Goblin
OK

Chameleon is an ideal companion to smArt, and a must for anyone who needs to make quick and easy colour changes to Draw files. As well as palettes for 16 and 256 colour modes, there are options for 256 shades of grey and a RGB colour cube which provides thousands of colours. Colours may be selected from other Draw files so can be copied from one picture to another. Colours may also be changed in HSV values; Hue, Saturation and Value. Edited files may be saved as normal Draw files or as colour separations. A clever Undo and Redo facility allows virtually any number of colour changes to be cancelled and then reinstated. Zoom and Magnification facilities allow accurate editing of small areas.

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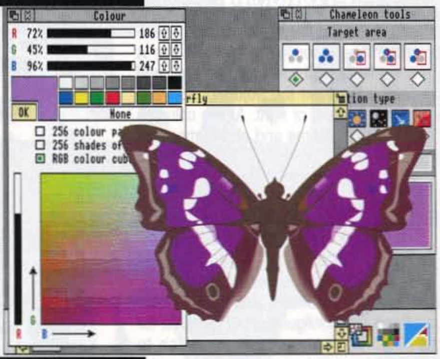
Colour
R 72% 186
G 45% 116
B 96% 247
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Chameleon tools
Target area
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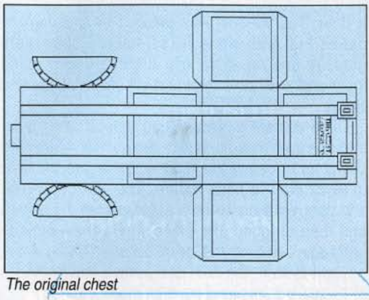
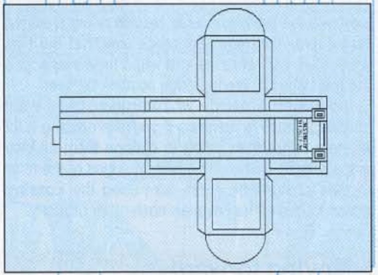
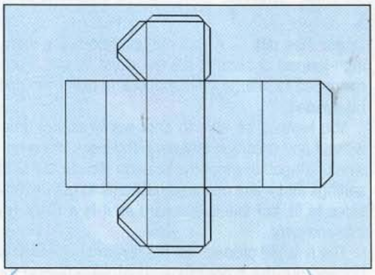
Making your own packaging is not so difficult – Steve Bruntlett shows you how



The original chest



With hindsight the finished version would be different



For the house, start with the basic outline

Design for living

WE ARE going to start to look at the use of DrawPlus to produce examples of 3D design in the form of packaging and constructions. This has a range of practical uses as well as for students taking GCSE or A Level Art and Design or Design and Communication, who are working to a packaging design brief.

The basic form of packaging is a straightforward box which can be used to contain items such as sweets or small presents. These are easy to design and make but also give scope for a wide variety of applied graphic designs and images using DrawPlus, paint packages, clip art and digitised or scanned images. If you're not sure how they work in terms of flaps and folding just look at examples you may have lying around such as film boxes, cereal packets and so on.

I produced an opening treasure chest when I'd only just started using Draw. The most complicated part of the design was working out how to make the length of the lid the same as its curve. This could only be done by trial and error. What we need in a graphic design package are measurement facilities to make the production of matching shapes much easier.

Making a moneybox

If I were redesigning the box there would be some changes, such as making sure I always used a grid setting no matter how small, as well as the snap to grid option to make sure the elements of the design lined up. The tabs on the sides of the lid were fiddly so I'd probably make the sides of the chest in one piece with the tops arched and leave the lid as a simple curved flap. It wouldn't work like an opening treasure chest but it would certainly be easier to design and put together.

To design a box with the proportions of a chocolate or cereal box you only need to design one box *net* which can be used as the basis for both vertically or horizontally opening boxes. Once you've designed it, you can scale it to produce boxes of different sizes. So it doesn't matter what size it is to start with, just concentrate on getting the proportion and the matching of the tops and sides of surfaces right.

Start by using the full A4 portrait setting on DrawPlus and work on the top half of the screen. If you want to produce a larger box you can always rotate it by 90 degrees using the Rotate option and scale it up to full A4 size using the Scale or Transform options with a setting of 1.33.

The Transform option gives you the additional benefits of scaling line thicknesses correctly. Whatever you do don't use the corners of the selected shape to rescale your design or your net will become distorted and the surfaces won't meet when you try to join them!

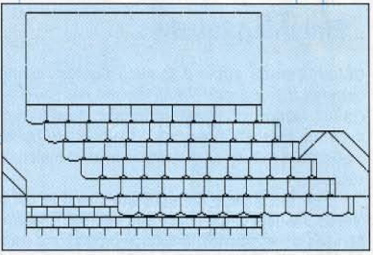
For a standard box you need a top, bottom, back, front, two sides and flaps or tabs. Set the Screen Grid setting to 1cm with the Lock setting to 2, which will allow you to move in 5mm steps. Create a box across most of the page making sure that it's an even number of centimetres across otherwise it won't divide up neatly into four surfaces.

Draw a line from top to bottom dividing it equally into two and then divide each half into two unequal areas, but make sure they're the same in both halves. If the rectangles look a bit thin group the outline box and the lines you've just drawn and rescale what you've drawn so far, but vertically only, otherwise the lines you've drawn won't lie on grid intersections.

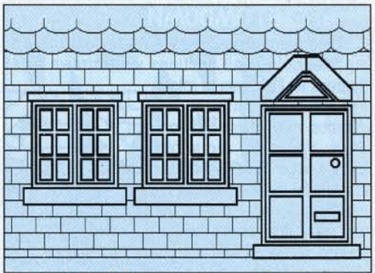
Now add the sides of the box, the width of which should be taken from the width of the narrowest rectangle. All you need now is some flaps which can be glued to hold the box together or tucked into the box to make a closing flap. These are a full centimetre wide, though they could be narrower, and are angled at 45 degrees to make them easier to glue and tuck in at the corners.

They can be rounded for the tuck-in type of flap if you prefer by changing the angled line to a curve and moving the control points. The two versions show how flaps are used to produce boxes from the same net by different positioning and use of tabs. The tabs to be glued are in grey.

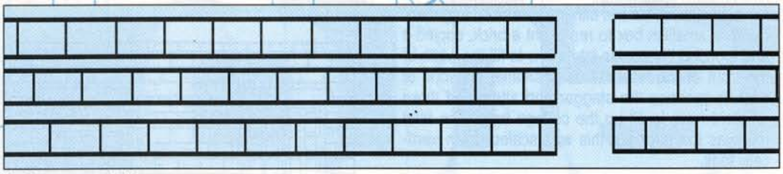
The best thing to do after you've designed the basic box is to print it out and check the measurements to see that when you fold it together all the surfaces meet at the edges without some being ➤



Tiling isn't usually so easy



Try your hand at a bit of glazing



Making your own bricks

You could have a go at designing a house next rather than a cottage.

➤

longer than others. If your printer distorts the drawing – impact dot-matrix are the worst for this – you may need to refer to the handbook to see if this can be avoided.

You have to be able to print out what you draw without any distortion otherwise the sides of the box won't fit together properly. You can reduce the Grid settings and make minor adjustments to get the box sides to fit, but this is awkward as it is a matter of trial and error.

The finished product is a moneybox shaped like a cottage but the proportions could be adjusted for any kind of building from a semi-detached house to a hotel. It has no opening flaps and so is more difficult to glue together.

An alternative would be an extra flap at the bottom of the tiles and a slot at the top of the cottage wall like the treasure chest fastening mechanism so that it could be used as a container rather than a moneybox. You can print the finished design, spray mount it on card and put it together.

Finishing touches

Colour can be applied to such designs using coloured ink or paper. When dry the net could be cut out with a craft knife, scored and glued to produce the finished moneybox. Scalpels are better than craft knives and are available in artist materials shops.

I drew the cottage the right way round to get a feel for the front of the house and the roof. The proportions were adjusted to cottage proportions once I'd laid out the basic surfaces. Making sure the roof sections matched the sloping sides was the trickiest part.

There are probably many ways to do this, but as my triangular wall sections were drawn at 45 degrees all I did was to rotate one of these through 45 degrees, move it into position, draw the roof rectangle slightly larger than I needed – to allow for the thickness of the card I was using – and copy it to make the second section of roof.

Once satisfied with the basic net, you can start adding detail. For instance, you could produce several different variations to make a village and start adding details which make your money boxes a bit more personal such as a house number, curtains and plants from your garden.

Work from photos or drawings if you want to make a replica of the house you live in.

The first thing I needed to add after printing out the net were the tabs at either side that I'd forgotten. I drew a smallish box to represent a brick, copied it and grouped the copies into a row to fill the width of the front of the house. I used smaller sections of brick to produce the stagger and alternated three different rows to fill up the cottage front. The final row was too thick but this was scaled down vertically to fit.

The tiles on the roof were produced in a similar way with the bottom straight section being changed to a curve. The main difference was that the tiles were filled with white so that when they overlapped the row beneath, the top edge couldn't be seen.

It's easier to decide what attributes you want shapes to have in advance if you're producing a lot of them rather than trying to change them all individually later. Some of the bottom edges of the rows of tiles couldn't be seen, so I used the Forward option to make them overlap each other properly.

Moving forward

You may need to use Forward a number of times to move one row in front of another. It depends how many other rows you have to jump past. I also grouped the blocks of bricks and tiles so that I could change their line width, line colour or fill colour in one go – this makes experimentation with colour schemes much easier.

The tiles on the triangular side panels were a bit trickier but are essentially copies of the roof tiles rescaled to fit the triangle with the tabs being filled in white and brought to the front of the drawing using the Front option. The corners show but you'll be cutting them off anyway.

The next thing I did was to produce a window and a door. The window was created by drawing the panes first with white fill selected. These were grouped and repeated with a frame drawn round them and a window lintel and sill drawn above and below.

Once you set a colour fill all shapes drawn after that use the same fill, in this case white, which was useful as I needed the window frame and the door to block out the brick texture. The window frames and door were drawn on a spare part of the screen and then dragged into place where they immediately sank behind the brick texture. Using Front brought them to the front and using a line thickness of 1 makes them stand out a bit more.

The last thing to do is to draw a slot for the top of the money box – making sure the fill is white – and drag it into position. You can then print it out and either use glue or double sided tape to stick the whole thing together but whatever you do, cut the slot first. You'll never do it when the money box is glued together.

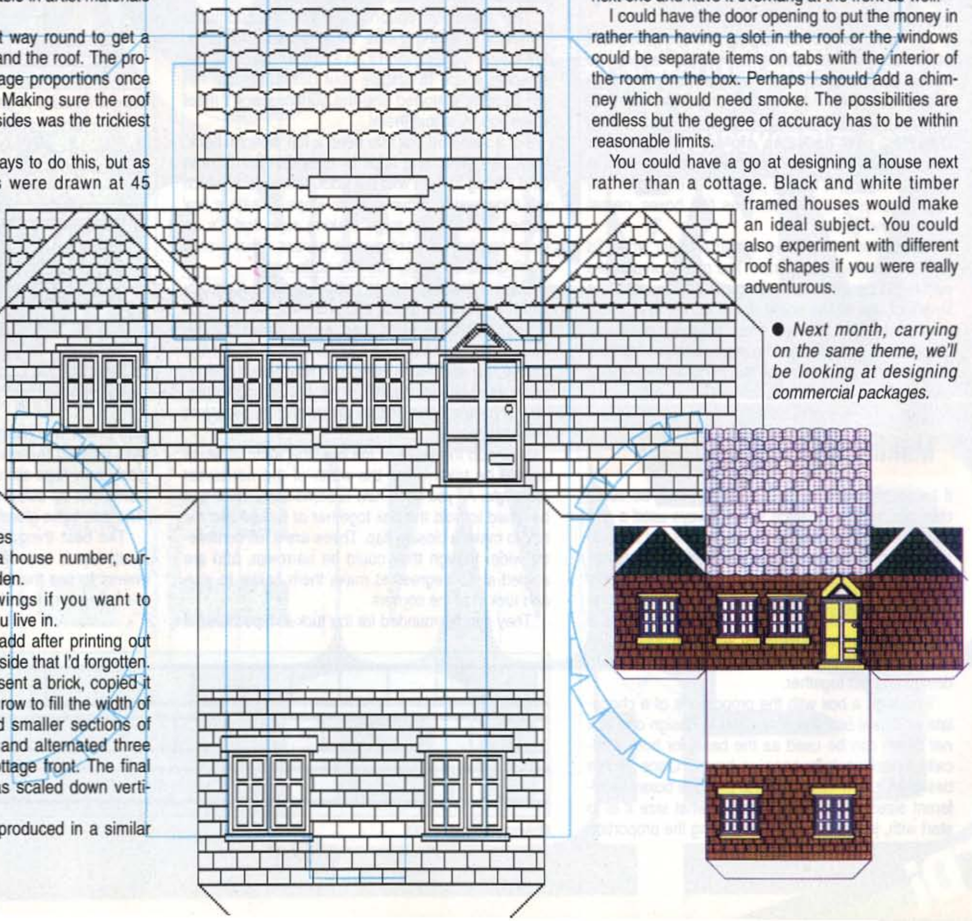
Enhancements

The slot makes the final construction easier as you can poke a ruler through it to press the back of the roof into place. I made the roof a bit longer at the back so that the tiles overhang. It looks rather good so I might treat the roof as a separate unit for the next one and have it overhang at the front as well.

I could have the door opening to put the money in rather than having a slot in the roof or the windows could be separate items on tabs with the interior of the room on the box. Perhaps I should add a chimney which would need smoke. The possibilities are endless but the degree of accuracy has to be within reasonable limits.

You could have a go at designing a house next rather than a cottage. Black and white timber framed houses would make an ideal subject. You could also experiment with different roof shapes if you were really adventurous.

- *Next month, carrying on the same theme, we'll be looking at designing commercial packages.*



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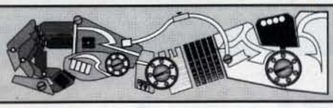

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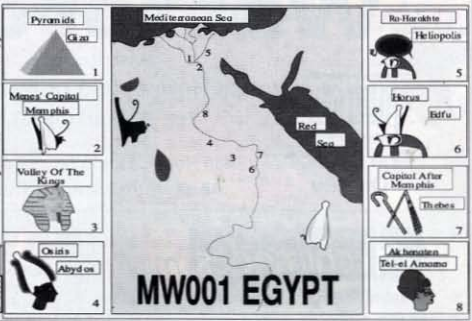

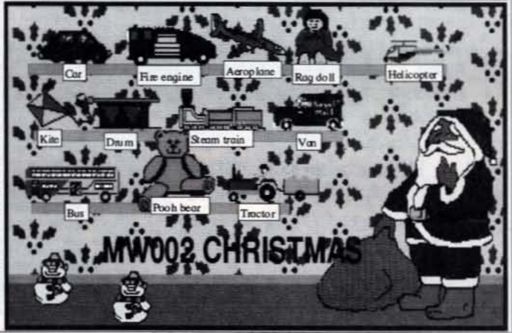

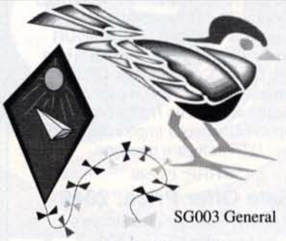

SG003 General

SG005 General

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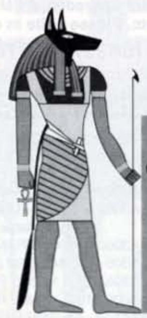

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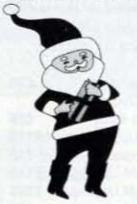

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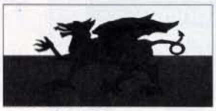
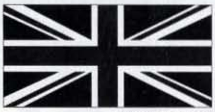
Disc MW002 CHRISTMAS	(Sample Screen Above)	£9.99

A Site Licence is Available for the above (Call For Details)



SG002 FLAGS



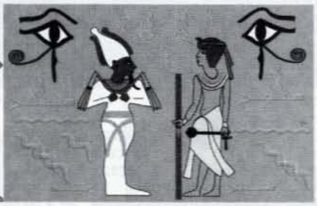
SG002 FLAGS

Studio Graphics

Top quality scalable Clip-Art. We have 5 sets available on various subjects.

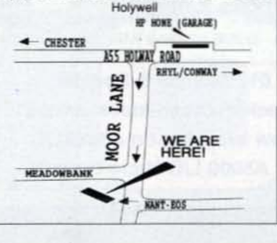
Discs are £8 each plus vat.

Disc SG001 Egypt 100+ files on this disc (Colour)
Disc SG002 Flags of the world 270 files (Colour 2 Discs £15)
Disc SG003 General 100+ files (Colour & B/W)
Disc SG004 Christmas 100+ files (Colour & BW)
Disc SG005 General 100+ files (Colour & BW)



Where to find us

From Chester follow old A55 past Holywell until you see Moor Lane on your right, turn down Moor Lane, we are at the bottom (Big White Farm Gate). From Rhyl (As Above) but turn left into Moor Lane before Holywell



Diamond-Public-Domain

For The Best In Archimedes PD Send £1.50 To Diamond PD.
At The Address Below For Catalogue/Demo Disc.

ARM TECH (UK) LTD
86 Meadowbank, Moor Lane,
Holway, Holywell, Clwyd CH8 7EF

TERMS

UK residents add 17.5% VAT to all prices except books. Prices and manufacturers specifications subject to change without notification. Goods offered subject to being unsold and/or available. Goods not offered on trial basis. Orders under £25 sent recorded delivery please add £1. Next day delivery £12. All goods despatched within 48 hours subject to availability. Restocking fee on non-defective returns.

THIS AD PREPARED USING C.Cs IMPRESSION 2.14

Watford Electronics

(A member of the Jessa group of Companies – Established 1972)

Jessa House, 250 Lower High Street, Watford WD1 2AN, England
Tel: Watford (0923) 237774 Tlx: 8956095 Fax: (0923) 233642

Acorn

The sign of Quality

Shop Hours: 9am to 6pm (Mon.-Sat.) Thursday 9am to 8pm. FREE customer car park.
All prices exclusive of VAT; subject to change without notice & available on request.

The choice of Experience

Archimedes micro

System	Basic	Mono	Colour	Multiscan
A540/1	£2495	£2555	£2655	£2815
A3000	£599	£665	£759	£924
A3000L/C	£642	£708	£802	£967
A5000	£999	£1065	£1159	£1324
A5000H/D	–	–	–	£1499
A5000L/C	–	–	–	£1531

Unbeatable Sale Offers on Archimedes Micro

When you purchase an Archimedes Micro from Watford, look what you get FREE with it

Micro	Free Offer
A410/1	ARM 3 Turbo Card upgrade fitted
A540/1	Multiscan monitor with VIDC enhancer and LC20 Printer
A3000	2Mb RAM; Monitor plinth and Acorn's A3000 Shoulder Bag (carrying case)

Plus of course our no quibble 12 months FREE On-Site Maintenance on all above Micros.

Archi Accessories

• 3.5" 800K 2nd Floppy Drive (305/310)	£118
• 5.25" 800K external Floppy Drive	£85
• I/O Podule (Analogue/User/1MHz bus)	£79
• I/O Podule (Analogue/User)	£49
• MEMC 1A Upgrade	£29
• MIDI add-on to I/O Podule	£27
• MIDI Expansion Card	£65
• Econet Network Board	£42
• Archimedes IEEE Interface Adaptor	£269
• Dual RS232 Podule	£195
• 16 bit parallel I/O Card	£195
• Archi replacement mouse – New design	£32
• PC Emulator v1.7	£85
• Software Developers Toolbox	£149
• Floating Point Unit	£455
• SCSI Adaptor Expansion Card	£156
• Keyboard Extension Lead	£6
• 2 Podule Backplane	£20
• 4 Podule Backplane	£25
• Fan for above backplanes	£8
• Risc Os Extras Software Disc	£5
• Ethernet Card	£220
• SCSI Card 8 bit	£129
• A5000 – 2 to 4Mb RAM Upgrade	£122

A3000 Accessories

• 3.5" External Drive	£95	• Monitor Stand	£13
• Technical Manual	£39	• Serial Upgrade	£17
• A3000 Dust Cover	£5		
• A3000 plus Monitor Dust Cover			£9
• A3000 User Port/Midi Upgrade Card			£44
• A3000 User/Analogue/IIC I/O Card			£42
• A3000 External Podule Case			£13

CREDIT CARD 24 HOUR Ansaphone Hot Lines (0923) 250234 or 233383

Staff Vacancy

Watford Electronics are inviting Hardware and Software engineers to apply for positions in their new R & D team. Hardware engineers must be familiar with the Archimedes architecture and able to follow a project from conception to production. Software engineers should be proficient in ARM assembler or Acorn C, and able to write RISC OS applications and module code.

Applicants should be well motivated and show experience in relevant areas. Qualifications are not as essential as your ability to produce innovative solutions to challenging problems. As a new member of the team you will be in a unique position to develop your career in a rewarding environment.

In the first instance forward your CV to Shiraz Jessa or Chris Honey

Archimedes A3000 Desk Top Publishing (DTP) Sale Offer

A3000 BBC Archimedes Micro with 3.5" Floppy Disc Drive and a mouse, upgraded to 2Mb RAM, COLOUR Monitor + Lead, 20Mb fast IDE Hard Disc Drive, 'Compression' Utility to increase the Hard Drive capacity to Typically 40Mb, The highly acclaimed Computer Concept's Impression Junior DTP software package.

RRP: £1299

Sale Offer Price: £849

Above Package plus Acorn's Learning Curve **£892**

Special Education discounts available on above package, micros, RAM upgrades, ARM 3 Turbo Card, etc. Please write in or telephone:

(0923) 237774/250335

Archimedes RAM Upgrade

All our memory upgrades are simple to fit. No soldering required. Fitting instructions supplied.

• **R302**-A3000 – to 2MB RAM Upgrade	£36
• **R303**-A3000 – to 2MB RAM Upgrade (expandable to 4MB)	£55
• **R304**-A3000 – to 4MB RAM Upgrade	£119
• **R311**-A305 – to 1MB RAM Upgrade	£30
• **R312**-A305/310 – to 2MB RAM Upgrade	£149
• **R314**-A305/310 – to 4MB RAM Upgrade	£205
• **R412**-A410/1 – to 2MB RAM Upgrade	£30
• **R413**-A420/1 – to 4MB RAM Upgrade	£60
• **R414**-A410/1 – to 4MB RAM Upgrade	£90
• **R810**-A410/1 – to 8MB RAM Upgrade	£599
• **R820**-A420/1 – to 8MB RAM Upgrade	£569
• **R840**-A440/1 – to 8MB RAM Upgrade	£499
• **R814**-R140 – to 8MB RAM Upgrade	£499
• **A5000** – to 2MB additional RAM Upgrade	£109

0% Finance & Special Teachers/Academics' prices Now available on A3000L/C and A5000 L/C Micro Systems

Convert your Archi 410 to a 420 or 440 with Watford's unique Upgrade Kits

UP10 – to 2MB RAM + 20MB Hard Disc	£159
UP15 – to 2MB RAM + 40MB Hard Disc	£245
UP20 – to 4MB RAM + 20MB Hard Disc	£225
UP30 – to 4MB RAM + 40MB Hard Disc	£309
UP40 – to 4MB RAM + 53MB Hard Disc	£429

Graphics, Art, Design & Games

GRAPHICS

ARCtist	£19
ARCticulate	£19
Atelier	£65
Artisan II	£45
Artisan Gallery	£16
Autosketch II	£65
Craftshop 1 & 2	£28
Euclid 2	£50
Graph Box	£59
Graphbox Professional	£107
HotLink Presenter	£40
Kermit	£46
Mogul	£17
Poster	£79
Pro Artisan	£70
Prime Art	£69
Render Bender 2	£95
Snippet	£21
Tween	£21

GAMES

Air Supremacy	£14
Apocalypse	£14
Arcade Soccer	£14
Avante Garde Fonts	£23
Boogie Buggy	£14
Break 147	£18
Bug Hunter	£13
Caverns	£13
Chess 3D	£14
Chocks Away 2	£14
Chocks Away Extra	£14
Chopper Force	£22
Conqueror	£15
Cops	£14
Corruption	£18
Crisis	£21
Elite	£33
Enter the Realms	£19
Enthar Seven	£21
E-Type	£14
E-Type Designer	£13
Family Favourites	£13
Fireball 2	£19
Grievous Bodily Arm	£19
Holed Out Designer	£13
Holed Out Golf	£13
Hostages	£14
Ibix the Viking	£13
Inter Dictor 2	£26
Iron Lord	£15
Jiglet	£25
Jigsaw	£27
Lemmings	£20
Masterbreak	£16
Magpie	£39
Man at Arms	£14
MahJong Patience	£15
Manchester United Europe	£19
Mig 29	£32
Nevryon	£14
Olympics	£14
Pandoras Box	£18
Pipe Mania	£17
Pirate	£16
Power Band	£14
Puncman 1 & 2	£16
Puncman 3 & 4	£16
Pysanki	£14
Quazer	£10
Real McCoy	£22
Real McCoy 2	£23
Redshift	£14
Return to Doom	£16
Revelation	£54
Repton 3	£14
Saloon Cars	£18
Spitfire Fury	£22
Splice	£25
Sporting Triangles	£24
Star Trader	£14
Superior Golf	£14
Super Pool	£19
Swin	£22
Talisman	£12
The Pawn	£19
Timewatch	£24
Trivial Pursuit	£22
Twin World	£15
U.I.M.	£23
White Magic 2	£15
Wimp Game	£13
Worldscape	£16
XFire	£19

Miscellaneous

Ancestry	£59
Arccomm 2	£38
Arcterm 7	£64
Armadeus Sound	£60
BBC DFS Reader	£6
Broadcaster Loader	£65
Compression (CC)	£38
Equasor	£38
FlexiFile	£97
Genesis Plus	£68
Genesis 2	£99
Investigator 2	£22
JX Archi Colour Printer Driver for Citizen & Star Printers	£15
Notate	£52
Numerator	£66
Pin Point	£65
Presenter 2	£29
Presenter Story	£145
Rainforest	£17
Revelation 2	£95
Rhapsody in Blue 2	£45
Show Page	£127
Speech!	£15
SWIV	£19
The Victorian	£17
Time Tabler	£549
Toolkit (Clares)	£35
Touchtype	£40
Tracker	£39
WorldScape	£17

Archimedes Hard Disc

Watford's ST506 Hard disc drives for A310 & A410 series fit internally into the space provided.
P.S. A310 upgrades require a backplane and a fan.

• **3HDP** – Hard Disc Podule only	£135
• **3HD20** – 20Meg H' Disc + Podule for 310	£235
• **3HD40** – 40Meg H' Disc + Podule for 310	£345
• **3HD50** – 53Meg H' Disc + Podule for 310	£474
• **4HD20** – 20Meg Hard Disc for 410	£129
• **4HD40** – 40Meg Hard Disc for 410	£215
• **4HD50** – 53Meg Hard Disc for 410	£335
• A3000 20Meg Hard Disc + Podule	£299
• A3000 40Meg Hard Disc + Podule	£429

For Low Cost, High Performance Archimedes IDE Hard Disc Drives, please turn to page 13

Desk Top Publisher

Acorn's Archi DTP Package	£108
Equasor	£39
Impression 2 DTP Pack	£125
Impression Junior	£69
Impression Business Supplement	£39
Impression II Borders Disc	£19
Expression-PS	£19
Tempest DTP Package	£90

Archi Wordprocessors

Pendown Archi	£48	1st Word Plus – 2	£63
Pendown Outline Fonts	£18	Archie Spell Master	£25
Wordwise + Disc	£24	PD Spellchecker	£40
Image Writer	£25	Graphic Writer	£19
Interword Disc	£24	EasiWord	£18

Databases

AlphaBase	£36	Magpie	£40
Flexifile	£79	Multistore v2.01	£176
Knowledge Organiser	£42		

Spreadsheets

Intersheet Disc	£24	Schema	£89
Viewsheet	£45		

Business Graphics

GammaPlot	£39	Sigmaplot	£39
Interchart Disc	£17		

Integrated Packages

• Logistix	£79	• Pipedream 4	£149

- Desktop Office – Database, Graphs & Charts, Wordprocessor Spreadsheet, Communications £98
- Desktop Folio – Wordprocessor, Desktop & Interactive Publishing. Ideal for school environment. £75

A3000 I/O Card (User, Analogue & IIC)

This NEW versatile I/O Card from Watford, fits inside the A3000 and includes an Analog to Digital Converter, a User Port, and an InterIC (IIC) connector.

The card allows many of the peripherals developed for the BBC to be used with the Archimedes A3000. The ADC and User Port have the same pin out and connectors as the BBC computers.

Extensive RISC OS software is supplied to provide BBC OSBYTE calls for support of the ADC and User Ports, including the BASIC keyword ADVAL. The software provides extended RISC OS support for separate interrupts from both the ADC and User Ports, permitting easy interrupt driven operation.

The card is provided with all the software in ROM and is automatically loaded when the machine is turned on.

Peripherals connected to the ports can obtain up to 500mA of power at +5V. A fuse is fitted to the card to protect the A3000 from damage arising from accidental short circuit of the power output.

The card is provided with an extensive manual explaining installation, all software commands, connector pin outs, hardware addresses and example programs.

Features
- An 8 bit User Port with a standard 20 way IDC connector, compatible with the User Port on the BBC computers and the Archimedes I/O Podule.
- A 10 bit Analog to Digital Converter with a standard 15 way D type connector, compatible with the ADC on the BBC range of computers and the Archimedes I/O podule.
- An InterIC (IIC) Port with a 5 pin DIN socket to connect the A3000 to external IIC devices.

£42

Archi Mouse Port Splitter

Our handy little splitter unit eliminates the risk of damaging your micro due to constant plugging and unplugging of the mouse by allowing you to connect both, a joystick and a mouse simultaneously to your Archimedes. £15

Silicon Vision

Gerber Plot	£95	Solids Render	£120
Solid CAD	£120	Solid Tools	£279
Super Plot	£28	Data Vision	£110
Super Dump	£22	Share Holder	£135
Arc PCB Professional			£275
Realtime Solids Modeller			£136

Archimedes to BBC Serial Link Mk 2

Using this simple data link, it is possible to solve all your BBC to Archimedes data transfer problems. The kit is supplied with a disk, and the necessary cable to connect the two computers.
New RISC OS Version **Only £15**

Archimedes External Disc Drive Interface

With this interface it is possible to connect almost any 5.25"/3.5" disc drive with its own power supply to the Archimedes. Upto 4 disc drives can be connected. Fully Buffered Board. NO SOLDERING is involved. Supplied complete with necessary lead.
• A300/A3000 £21 • A400 £25

More Archimedes Products
See Pages 3, 5, 6, 8, 10, 13

LANGUAGES (Archimedes)

ISO-PASCAL; FORTRAN 77			£77 each
Assembler; LISP; Prolog X			£149 each
ANSI C Rel. 3	£125	Logotron Logo	£45
Macro Assembler	£40	Risc Basic	£120
Robo Logo	£69	Risc FORTH	£110
BASIC Compiler	£77		

NEW 256 Grey-Scale Scanner

Watford proudly introduces its new innovative 256 grey-level hand scanner for the Archimedes range of micros. It offers up to 400 dpi scanning resolution, complete with software.

256 Grey-Scale Scanner is ideal for incorporating pre-drawn logos, artwork, photographs and sketches into desktop publishing documents and other graphics programs. Designed by our own R & D team, it offers the best overall scanning solution for Archimedes micro. Just compare the competition on our price and these outstanding features:

- Full 105mm 400dpi scanning operation in just 3mS per line! (Twice as fast as most scanners.)
- Selectable 256/16 grey levels
- Full scan preview, scale to fit windows
- Complete set of image enhancement tools
- Single width podule
- True brightness and contrast control
- Fast RISC OS printing
- Over 1000 Image processing options; smoothing, enhancement, edge deletion, convolution, etc.
- Full Interface to ChangeFSI

Special Launch Price
£185

ULTIMUM – Archimedes A3000 Podule Racking System

THE ONLY LOGICAL WAY TO EXPAND YOUR A3000 COMPUTER

Price: £149

Minerva's Archimedes Software

EasyWord	£18	Mailshot*	£27
Home Accounts	£35	Reporter*	£27
Time Tabler	£549	School Admin*	£65
System Delta	£59		
System Delta Program Reference Manual			£29

** Requires System Delta to operate*

Stand alone Business Accounts Packages
Sales; Purchase; Order Processing and Invoicing; Nominal; Stock management
£79 per module
or Complete Business Package **£325**

ARM 3 Turbo Card

Simply The Best

Here it is at last – the all new Mark 2 version of Watford's highly acclaimed ARM 3 processor board for the Archimedes and now also the A3000 series computers. Using the latest surface mount technology on a high quality four layer circuit board we have reduced the overall size to a mere 53mm x 45mm, and the cost to only £199. Mk II upgrade will increase the speed of your micro by a factor of 3 to 6.
Any competent A300 or A400/1 series micro owner can fit the upgrade himself, as we provide full fitting instructions and a special ARM chip extraction tool. However for A3000 micros and those not wishing to perform the upgrade themselves, we will collect, upgrade and return your micro by courier service, at an additional cost of £18.
(A300 and old A440 series owners please note – you will need to upgrade to MEMC1A for ARM3 to work.)

RRP £249

Offer Price £169

Acorn have satisfactorily evaluated Watford's ARM 3 upgrade and the A3000 upgrades are fitted by Acorn approved surface mount technology centre, therefore its fitment will not invalidate Acorn's warranty on the micro.

Continued→ → → → → → → → →

BBC MASTER

MASTER 128K Micro incl. Acorn's View, Viewsheet, ADFS, BASIC Editor & TERMINAL plus FREE OFFER (see below) £399

FREE OFFER

A 5.25" Double Sided, 40/80 track switchable 400K Disc Drive complete with cables and a Utilities disc incl. 2 games, plus

Gemini's OFFICE MATE & OFFICE MASTER packages on Disc consisting of: Database, Spreadsheet, Beebplot graphics. Accounts packs: Cashbook, Final Accounts, Mailist, Easyledger, Invoice & Statements, Stock Control.

FREE with every BBC Master purchased from us during April

Add-Ons & Accessories

Econet Module for the Master		£42
Twin ROM Cartridge for Master		£9
Quad ROM Cartridge for Master		£14
Master Reference Manual I	(No VAT)	£14
Master Reference Manual II	(No VAT)	£14
Master Advance Ref Manual	(No VAT)	£17
64K Upgrade Kit for B+		£32
Acorn 1772 DFS Kit complete		£49
ECONET Upgrade Kit for BBC B		£42
ALL ECONET UPGRADES Available		
ARIES' IEEE Interface for BBC B & Master		£238
Morley Teletext Adaptor with ATS Rom		£99
Ecolink		£270

Z88 Portable Micro

£179

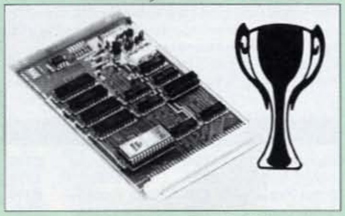
FREE

With every Z88 purchased from us, we are giving away absolutely FREE, a Z88 to BBC Interface Link, 4 rechargeable batteries and a compact Mains Battery Charger worth £38.

Z88 ACCESSORIES

• 32K RAM Pack or 32K EPROM Pack			£16
• 128K RAM Pack or 128K EPROM Pack			£32
• 512K RAM Pack			£86
• 256K Eprom Pack			£55
• Z88 Eprom Eraser Unit			£38
• Z88 Carrying Case			£8
• Z88 Computing Book			£9.95
• AA Nicad Rechargeable Battery			£1.50
• Battery Charger Compact & Fast			£6
• Z88 Serial Printer Cable			£8
• Z88 Parallel Printer Cable			£18
• Z88 to Archi Link			£15
• Z88 to BBC Link	£8	• Z BASE	£56
• Z88 to PC Link II	£27	• Z TAPE	£42
• Z88 to Macintosh	£32	• Z TERM	£42
• Z88 Mains Adaptor	£9	• Z88 Modem	£114

Archi Real-Time Digitiser



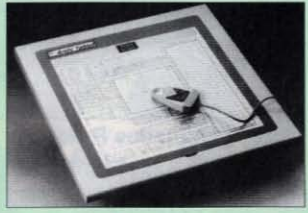
Now supplied with NEW RISC OS Version Software

Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air televison signals may also be digitised via a video recorder or TV tuner. Please write for further details.

Price £119

A Set of Colour Filters for colour image grabbing using a video camera **£16**

Archi Graphic Tablet



The Archi Graphic Tablet offers performance and accuracy comparable to other tablets priced at well over £400, and has the useful addition of a liftable cover, which can hold tracing material or menu templates securely. The package is supplied complete with sophisticated Archi software. (Now, fully LinCAD compatible. Recommended by Linear Graphic for use in Education).

(FREE this month, PC Mouse Drivers & Art package)

Special Price £165

(Price includes Tablet, Leads, Software & Puck)
Stylus Optional Extra **£15**

Archi Graphic Tablet Junior. Working area 9" x 6". Price includes Stylus **£110**

Disc Plonker Rack

When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the hazards of fingerprints, scratches, dust, coffee and an untidy desk. Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs.

Protection at Only: **£2**

Special Bulk Offer Discs

(Supplied packed in Anti-Static Lockable Storage Units)
(Lifetime warranty on Discs)

BULK PACK DISCS in lots of 100

Type	S/S 40T	D/S 40T	D/S 80T
• Without Sleeves 5.25"	£28	£33	£38
• With Sleeves 5.25"	£31	£36	£41
• 3.5" D/S D/D	£27 for 50	£49 for 100	

Acorn & Watford DFSs

• Watford sophisticated DFS ROM	£16.00
• Watford DFS Kit complete	£69.00
• We will exchange your existing ROM for Watford's ultimate DFS ROM at only	£12.00
• DFS Manual (comprehensive)	£6.95
• Acorn DNFS ROM	£17.00
• Acorn ADFS ROM only	£25.00
• Acorn 1772 DFS ROM Kit	£49.00

(The single Density DFS system is now old technology. Like Acorn, Watford too have replaced it with their more up-to-date 1772 DDFS Interface. We have informed most of the software houses of this decision in order that they can ensure compatibility with our highly sophisticated and fully Acorn compatible DDFS).

Watford's MkII 1772

Single/Double Density DFS

Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1772 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1772 DFS, plus the added features as follows:

- Acorn ADFS compatible – Use ADFS on our DDFS board.
- Auto 40-80 Track sensing – no need to fuss with 40/80 track switches.
- An extremely powerful 8271 emulation – ensuring compatibility with almost all software.
- New low profile – small footprint board.
- Option to double the speed of file handling operations – BPUT and BGET.
- Operates in both single and double density modes.

• SPECIAL PRICE	**£44.00**
• DDFS Manual	(No VAT) **£6.95**
• We will exchange your existing DFS Kit for our sophisticated DDFS for only	**£30.00**

3M – Diskettes

3M – SCOTCH Diskettes with Lifetime warranty from Watford Electonics your 3M Appointed Distributor

• *10 x 5.25" S/S D/D 40T (744)*	*£5*
• *10 x 5.25" D/S D/D 40T (745)*	*£5*
• *10 x 5.25" S/S D/D 80 Track (746)*	*£7*
• *10 x 5.25" D/S D/D 80 Track (747)*	*£7*
• *10 x 5.25" 1.6M D/S D/D High Density for IBM XT and AT*	*£9*
• *10 x 3.5" S/S D/D 40/80 Track*	*£7*
• *10 x 3.5" D/S D/D 40/80 Track*	*£7*
• *10 x 3.5" Double Sided High Density*	*£13*

Top Quality 3.5" & 5.25" Diskettes

To complement our range of Quality Discs and Disc Drives. WE are now supplying SPECIAL OFFER packs of 10 Lifetime guaranteed discs. Each disc has a reinforced hub ring. Supplied complete with selfstick labels and a Plastic Library Disc Box.

• *10 x **M3** 3.5" D/S D/D 80 Track*	*£7*
• *10 x **M9** 3.5" D/S High Density*	*£12*
• *10 x **M4** 5.25" S/S D/D 40 Track*	*£5*
• *10 x **M5** 5.25" D/S D/D 40 Track*	*£5*
• *10 x **M7** 5.25" D/S D/D 80 Track*	*£7*
• *10 x **M8** 5.25" D/S H/D Hi-Density*	*£9*
• ***M2** 3" Double Sided*	*£2.50 each*

Quality Disc Drives from Watford

All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. All 5.25" Disc Drives are 40/80 track switchable. For ease of use, the switches are front mounted.

Various UK "manufacturers" of disc drives for the BBC Micro (more accurately, "packagers" label other manufacturers drives with their own name). We buy the high quality NEC and Mitsubishi drives in large quantities directly from the manufacturers, package them and sell them at "dealer" prices direct to the public.

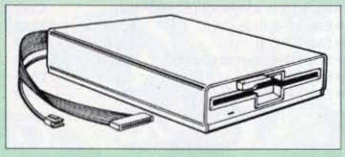
If you look around the popular BBC Micro press, you will find that the prices we quote for the top quality, new slimline disc drives are, virtually without exception, the best around. These prices, coupled with the backup of one of the country's largest distributors of BBC peripherals provides a superb deal.

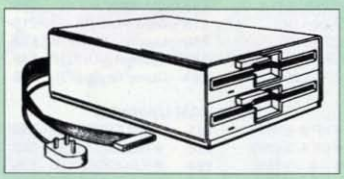
Unless you anticipate using dual drives in a fully expanded BBC system for long periods of time with little ventilation, then we suggest that our range of "CL" disc drives without the PSU (Power Supply Unit) would be quite adequate (extensive tests within our workshops have confirmed this). All drives are supplied complete with a SPECIAL UTILITIES Disc, Cables and Plugs. The Drives with power supply have a mains moulded plug for safety purposes. ***Ideal for Schools & Colleges.***

When using a BBC Micro, most people find themselves short of desk space. The Watford's BBC Micro plinths form an ideal way of recovering some of this precious space. Your BBC Disc Drive and Monitor can all occupy the same vertical footprint and still be comfortably situated. With the Watford Double Plinth, your Disc Drive is mounted vertically at one side, leaving a very valuable area directly in front of you for such useful items as spare discs, pen, paper, reference manuals, etc. Follow the trend with a Watford plinth. (Turn to the 6th page of our advert for the Plinths).

P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is our special Compact Disc Drive cables designed by us.

"Test Bureau Approved for Use in Education"





Our Disc Drives conform to BS415

Type	Description	
	Disc Drive without PSU	
• **CLS400S:**	Single, 40/80 track 400K Double sided Drive	**£70**
• **CLD800S:**	Twin, 40/80 track, 800K Double sided Drives	**£138**
	Disc Drive with PSU	
• **CS400S:**	Single, 40/80 track, 400K Double sided Drive	**£80**
• **CD800S:**	Twin, 40/80 track, 800K Double sided Drives	**£153**

Special Cable to connect both 3.5" and 5.25" Disc Drives simultaneously to the BBC Compact £13

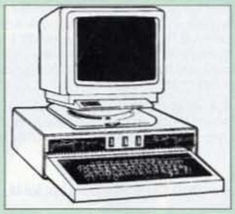
3.5" Disc Drive

These top quality 3.5" Double sided, 80 track, are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Type	Description	
	Disc Drive without PSU	
• **CLS35:**	Single Disc Drive, 400K	**£59**
• **CLD35:**	Twin Disc Drives, 800K	**£109**
	Disc Drive with PSU	
• **CS35:**	Single Disc Drive, 400K	**£82**
• **CD35:**	Twin Disc Drives, 800K	**£126**

(P.S. CS35 is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage)

Disc Drives in Monitor Stand



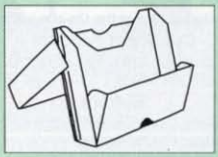
• **CDPM 800S** – Twin 5.25", 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC B & Master 128K micros. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

£165

• **DP35 800** – Same as above except, one disc drive is a 5.25" and the other is 3.5".

£154

Plastic Library Cases



DLC1 –	Holds 5 x 3.5" Discs.	**£1.50**
DLC2 –	Holds 10 x 3.5" Discs.	**£1.90**
DLC3 –	Holds 5 x 5.25" Discs.	**£1.60**
DLC4 –	Holds 10 x 5.25" Discs.	**£2.00**

Disc Albums

Attractively finished in leather-look PVC Vinyl

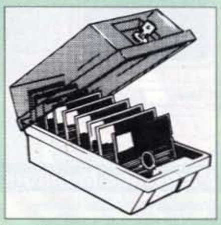
DW1 –	Holds 6 x 3.5" Discs	**£2.50**
DW2 –	Holds 6 x 5.25" Discs	**£3.00**
DW3 –	Holds 20 x 5.25" Discs	**£3.50**
DW4 –	Holds 40 x 3.5" Discs or 5.25" Discs	**£4.50**

Floppy Head Cleaner Kit

The heads in floppy drives are precision made and very sensitive to dirt. The use of Cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. it is very simple to use. Available in 3.5" & 5.25", please specify.

Price £4

Antistatic Lockable Disc Storage Units



Gives double protection – Strong plastic case that affords real protection to your discs.

Antistatic helps avoid data corruption whilst in storage. The smoked top locks down.

Dividers and adhesive title strips are supplied for efficient filing of discs.

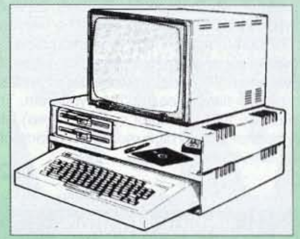
• **M35**	– holds up to 50 5.25" discs	**£4.95**
• **M85**	– holds up to 95 5.25" discs	**£6.95**
• **M25***	– holds up to 25 3.5" discs	**£4.95**
• **M50**	– holds 50 3.5" discs	**£6.50**
• **M100**	– holds 100 3.5" discs	**£6.99**
• **M10**	– holds 8 of No. 10 Data Cartridges	**£15**

* Not lockable

Dust Covers (For our Disc Drives)

Single CLS (without PSU)	**£3.20**
Single CS (with PSU)	**£3.25**
Twin CLD (without PSU)	**£3.85**
Twin CD (with PSU)	**£3.90**

Plinths for the BBC B, BBC Master & A3000



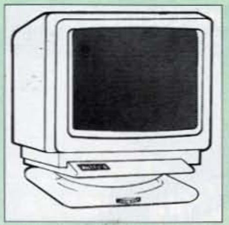
Protect your computer from the heat of your VDU. Our micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and VDU, whilst the double height version provides enough room for our stacked disc drive and other peripherals like, Eprom programmer, music unit or simply discs & stationery. The computer slides neatly in the lower section allowing easy access to remove the lid. Colour: Matching BBC Beige.

Single BBC Plinth	420 x 310 x 105mm	**£13**
Double BBC Plinth	420 x 310 x 210mm	**£24**
Single Master Plinth	490 x 310 x 105mm	**£14**
Double Master Plinth	490 x 310 x 210mm	**£26**

A3000 Single Plinth (very sturdy & precision made), has a slot on the left for the switch & cut out on the right for 3.5" Disc Drive **£13**

CREDIT CARD 24 HOUR Ansaphone Hot Lines (0923) 250234 or 233383

Continued→ → → → → → → → →



FREE
Monitor lead.
Please specify
type required
when ordering
your monitor.

Microvitec Monitors

• **1431** – Standard Resolution Monitor	£169
• **1451** – Medium Resolution Monitor	£209
• **Cub3000** Medium Res for A3000	£189
• **1441** – High Resolution Monitor	£359
• Dust Cover for Microvitecs	£5.50
• **Touchtec 501 Touch Screen**	£239

Now 3 years Parts & Labour warranty on all Microvitec Monitors

Multiscan Colour

• Eizo 9060S	£389	• NEC 6FG	£1525
• Eizo 9070S	£579	• Taxan 770LR	£362
• NEC 3FG	£370	• Taxan 775	£362
• NEC 4FG	£465	• Taxan 795	£397
• NEC 5FG	£850	• Taxan 875	£685
• VIDC Enhancer Board			£25

(We will supply the Watford's superior Multiscan VIDC Enhancer for Archimedes micro at only £10, if purchased with any Eizo or Taxan monitor.)

(P.S. Taxan 795 monitor is supplied with a FREE VIDC enhancer board)

Aries AlphaScan Monitor

Pound for Pound, the AlphaScan VGA Multiscan monitor provides the maximum performance and greatest flexlbility of any 14" colour monitor for the Archimedes micro.

Its multiscan circuitry provides automatic adjustment for frequencies between 30 and 60KHz horizontal, and 50 and 90Hz vertical. Its 0.28mm dot pitch high resolution tube provides super sharp text graphics, while a high speed (70/72Hz) refresh rate provides a flicker-free display easing the eye strain. The Multivideo VIDC Adaptor supplied (free) with the monitor allows high resolution operation in all screen modes.

£325

Philips Monitors

• **BM7502** 12" Hi-res Green Monitor	£67
• **CM8833** 14" Med. Res Colour Monitor	£167
• Dust Cover for Philips Monitors	£6

STAR BUY

- **PHILIPS 14"** Medium Res, dark glass, attractively finished Colour Monitor. A push-button switch toggles between Hi-Res monochrome green text mode and full colour display. (Please state the type of Connecting Lead you require).

ONLY £166

Spare Monitor Leads

BNC Lead for Zenith or Philips	£3
Skart Monitor Lead	£5
RGB lead for TAXAN Monitors	£3
Archimedes Colour Monitor Lead	£7.50

Concept Keyboards

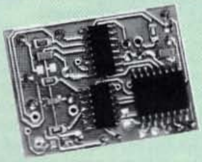
Standard A3 Keyboard with BBC Software	£138
Standard A4 Keyboard with BBC Software	£109
Archi A3 Keyboard	£139
Archi A4 Keyboard	£110

Aries 2000 Colour Monitor

This attractively finished, etched screen medium res monitor is supplied complete with built-in speaker, volume control and video output. All controls are located on the front panel for ease of use. Ideal for BBC, BBC Master, Archimedes and Amiga.

A bargain at £159

VIDC Enhancer



This unique VIDC add-on board for the Archimedes, caters for all types of Multiscan and VGA monitor and mode requirements. There are 2 versions to suit all requirements. The multimode software supplied, provides all the new modes for the selected monitor type, including the now standard Computer Concepts modes. With VGA monitor, you are no longer restricted to a few modes. A WIMP application supplied on disc, allows new modes to be designed and existing modes to be modified for particular monitors.

Super VGA VIDC Card: A unique electronic design allows the horizontal and vertical sync to be buffered and the polarity changed under software control

£45

MultiVideo VIDC Card: As above but for MultiScan monitors only.

£25

Panasonic Printers

• KX-P1123	£129	• KX-P1695	£272
• KX-P1124i	£173	• KX-P2624	*£295
• KX-P1170	£100	• KX-P2180	£165
• KX-P1624	£272	• KX-P2123	£219
• KX-P1654	*£335		

*** Price includes 12 months On-site warranty**

Cut Sheet Feeders

P36 – 1124/24i	£79	**P37** – 1123/70/80	£69
P38 – P1624/95; P2624			£129

Buffers

P12 4K Buffer Board for KX-P1081	£55
P14 32K Buffer P1123/24/70/80 P1540/92/95; P1624/54/95	£16

Serial Interfaces

P19 for P1123/24/24i/70/80/1624/54/95/2624	£49

Citizen Printers

• 120D Plus	£100	• Swift 9	£134
• 124D	£145	• Swift 24E#	£234
• 224	£185	• Swift 24X	£299
• PN-48	£209	• PN48 Ribbon	£4

# FREE Colour Option with Swift 24E

• Swift 9 Colour Option		£19
• Swift 24 Colour Option		£29
• Swift 24 Ribbons	Black £4	Colour £13
• Citizen/Archimedes Colour Printer Driver		£15

Integrex Colour Jet

• Colour Jet 132 Printer	£449
• Paper Roll	£6.50
• BBC Screen Dump Software	£10
• Colour Cartridge	£21
• Black Cartridge	£12.40
• 100 A4 OHP transparencies	£55
• 8K Serial Interface Optional	£123
• Colour Jet 2000	£POA

Star Printers

• LC15	£173	• LC200 Colour	£143
• LC20	£100	• SJ48 Inkjet	£174
• LC24-10	£133	• XB24-200 Colour	£295
• LC24-15	£240	• XB24-250 Colour	£355
• LC24-20	£169	• XB24 Colour kit	£29
• LC24-200	£164	• ZA200 Colour	£234
• LC24-200 Colour	£203	• ZA250	£297
• Star/Archimedes Colour Printer Driver			£15

Star Accessories

Cut Sheet Feeder

LC10/200/24-10	£65	LC15/LC24-15	£125
XB24-10	£80	XB24-15	£139

Serial Interfaces

8K Ser LC-200; LC24-200; FR10; FR15; XB24-10; XB24-15	£52

Buffers

32K Ram Card for LC/XB24-10; 15; LC200	£55

Ribbons

LC10; LC10-II; LC15	Black £4;	Colour £6
LC-200; LC24-200	Black £5;	Colour £12
XB24-10; XB24-15	Black £5;	Colour £12

Laser Printers

All Laser Printers include 12 months On-site maintenance

• Brother HL-4	4ppm	£594
• Brother HL4-V	4ppm	£694
• Brother HL4-PS Postscript	4ppm	£1079
• Brother HL8-V	8ppm	£1044
• Canon LBP-4+	4ppm	£575
• Canon LBP-8 III	8ppm	£970
• Canon LBP-8III Plus	8ppm	£965
• Epson EPL4100	6ppm	£550
• Epson EPL7500	6ppm	£1150
• Epson EPL8100	10ppm	£965
• HP Laserjet IIP+	4ppm	£625
• HP Laserjet III	8ppm	£1015
• HP Laserjet IIID	8ppm	£1499
• HP Laserjet IIIP	4ppm	£705
• HP Laserjet IIIsi	16ppm	£2525
• Panasonic KX-P4420	8ppm*	£620
• Panasonic KX-P4450i*	11ppm*	£925
• Panasonic KX-4455 Postscript	11ppm*	£1450
• Panasonic KX-P4430 Satin Print*		£999
• Star LP-8 III 2	8ppm	£1249
• Star LP-8 III	8ppm	£910
• Star LP-8 Star(post)script	8ppm	£1140
• Star LP-4	4ppm	£565
• Star LP-4PS Postscript	4ppm	£779

* Now with 2 years On-site warranty

Laser Toners

Canon 2, 3 & 4	£46	Star LP-8	£56
Epson GQ	£13	KX-P4420/50	£19
EPL 4100	£59	Laserjet HP IIP & IIIP	£42
EPL7100	£82	Laserjet II/D, III/D	£48
EPL7500	£99	Qume Crystal (3)	£58

Laser RAM Upgrades

• IIP & III 1MB	£51	• EPL7100 256K	£39
• IIP & III 2MB	£88	• GQ5000 512K	£42
• II & IID 1MB	£64	• KX4420/50 1M	£75
• II & IID 2MB	£99	• KX4420/50 2M	£115
• II & IID 4MB	£146	• KX4420/50 4M	£195
• Canon LBP4 1M	£105	• Star LP8 1M	£139
• Canon LBP8 2M	£125	• Star LP8 2M	£275

Laser Drum & Developer

• Epson Drum	GQ5000	£93	EPL7100	£129
• Panasonic 4420 Drum		£60	Developer	£59
• Panasonic 4450 Drum		£93	Developer	£80
• Qume Drum		£76	Developer	£56

Jetpage Postscript Cartridge

• HP IIP/III	£225	IID & IIID	£227

Various Add-Ons

• Laserjet Appletalk Interface	£135
• HP Adobe Postscript	£399
• Pacific Page Postscript	£259
• HP Premier Font Collection	£28
• Laserjet various Font cartridges	from £45

Hewlett-Packard Printers

• # Desk Jet 500	**£285**	• Paintjet XL	**£1045**
• Desk Jet 500 Col.	**£449**	• Quiet Jet Plus	**£384**
• Paint Jet Colour	**£430**	• HP Think Jet	**£265**

# 3 years extended Parts & Labour warranty	**£49**
• DeskJet 500 Cart. Black **£15;** Colour	**£27**
• Paintjet Cartridges Black **£19;** Colour	**£23**
• Desk Jet 500 256K RAM cartridge	**£99**
• HP Epson FX Emulation Cartridge for Desk Jet	**£59**
• DJ 500 High Capacity Black Cartridge	**£21**

Plug In Font Cartridges for DJ 500

• 22706B – Prestige, Elite, Line Draw fonts	**£55**
• 22706C Letter Gothic & HP Line Draw fonts	**£56**
• 22707P – Proprint Emulation Cartridge	**£57**
• Desk Jet Unlimited (Book No VAT)	**£19.75**

Canon Bubblejet Printers

	Printer	CSF	D'ble Bin	Ink Cart
BJ10EX	£183	£43		£16
BJ300	£289	£88	£65	£12
BJ330	£380	£110	£79	£12
BJC800C	£1419			

• Spare Battery pack for BJ10E	**£33**

NEC Pinwriter Printers

• P20	**£180**	• P70	**£419**
• P30	**£240**	• P90	**£635**
• P60	**£325**		

• P60/70 Colour Option Kit	**£59**
• Ribbons Black for P20/30 **£6** for P60/70/90	**£7**
• Ribbons for P60/70/90 Black **£9** Colour	**£13.50**

Cut Sheet Feeders

P20 **£59;** P30 **£85;** P60 **£89;** P70/90 **£80**

Epson Printers

DFX5000	**£1079**	LQ1060 Colour	**£595**
DFX8000	**£1960**	LQ1070	**£313**
FX850	**£264**	LQ1170	**£435**
FX1050	**£336**	LQ2550+	**£675**
LQ100	**£159**	LX400	**£101**
LQ200	**£162**	LX850+	**£140**
LQ450	**£165**	LX1050	**£206**
LQ570	**£205**	SQ850	**£432**
LQ860 Colour	**£444**	SQ2550	**£625**
LQ870	**£362**		

Cut Sheet Feeders for

LQ570, LQ870			**£47**
LX400/850/LQ200/400/450/500/550 LQ1010/1070/1170			**£72**
LX1050	**£115**	FX850/LQ860	**£128**
FX1050/LQ1060/SQ850			**£155**
LQ2550	**£299**	SQ2550	**£210**

Tractor Feed for

LQ800 **£44;** LQ850/FX850 **£69;** LQ1050/FX1050 **£85;** LQ2500 **£90;** LQ2550 **£90.**

Accessories

• EX800/1000 Colour Option	**£45**
• EX800/1000 Colour Ribbon	**£14**
• LQ2500 Colour Option	**£65**
• Multifont Card for LQ550/850/1050	**£95**

Epson Printer Interfaces

RS232	**£28**	RS232 + 2K Buffer	**£52**

Printer Leads

BBC Centronics 4' long	£5
BBC Centronics 6' extra long	£7
Compact's Special Centronics Lead	£7
Nimbus Centronics Lead	£6
IBM/Archimedes Parallel Lead 6'	£4
IBM/Archimedes Parallel Lead 5 metres	£10
IBM/Archimedes Parallel Lead 10 metres	£15
Double Ended 36 way Centronics Lead 4'	£7
Double Ended 36 way Centronics Lead 6'	£9
MSX Centronics Parallel Lead 4'	£12
RS232 Leads (Various)	P.O.A.
IBM Keyboard extension lead coiled	£5

Plotters

• HP7440AU	**£525**	• HP7475AU	**£715**

Roland Plotters

• DXY1100	**£490**	• DXY1200	**£620**
• DXY1300	**£825**	• DXY2500	**£2345**
• DXY3500	**£2955**	• Sketchmate	**£310**
• Roland plotter Pens, Fibre tip			**£7.50**

Listing Paper (Perforated)

• 1,000 Sheets 9.5" x 11" Fanfold Paper	**£7**
• 2,000 Sheets 9.5" x 11" Fanfold Paper	**£11**
• 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold	**£21**
• 1,000 Sheets 15" x 11" Fanfold Paper	**£9**
• 2,000 Sheets 15" x 11" Fanfold Paper	**£16**
• 1,000 Sheets true A4 Fanfold Paper 70gms	**£11**
• 2,000 Sheets true A4 Fanfold Paper 70gms	**£21**
• Teleprinter Roll (Econo paper)	**£4**

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

Carriage 1K Sheets £2.50, 2K Sheets £3.00

Printer Labels

(On continuous fanfold backing sheet)

1,000 90 x 36mm (Single Row)	**£6.00**
1,000 90 x 36mm (Twin Row)	**£6.25**
1,000 90 x 49mm (Twin Row)	**£7.50**
1,000 102 x 36mm (Twin Row)	**£6.75**

Laser Printer Labels on A4 Sheets

3750 70 x 29mm (3 Rows)	**£13.50**
3000 70 x 37mm (3 Rows)	**£13.25**
2625 70 x 42mm (3 Rows)	**£13.00**

Printer Ribbons & Various Dust Covers

Type	Ribbons	Dust Covers
BBC Micro	–	£3.50
BBC Master	–	£4.00
Archimedes Micro pair	–	£9.00
Citizen 120D	£2.75	£4.50
DMP2000	£2.75	£4.75
DMP4000	£3.75	£4.85
EX800/1000	£3.50	£5.00
RX/FX80/85/800/MX80	£2.95	–
FX/MX/RX100/1000	£3.95	–
Kaga/Taxan KP810/815	£3.25	£5.00
LQ400/500/550/800/850	£3.25	£6.00
LQ1050/LQ2500	£4.00	–
LX80/86/800/850	£2.75	£4.50
LX400	£3.50	£5.00
M1009/GLP	£2.95	£3.75
NEC P2200	£4.50	£5.00
Panasonic KX1080/81	£3.25	£4.75
Panasonic KX-P1124	£7.00	£5.00
Star LC24-10	£2.95	£6.00
Olivetti Ink Jet Cartridges (set of 4)	£6	

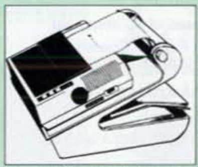
Original Panasonic Ribbons

Guaranteed to last 3 million characters

P110 for KX-P1081, 1592 & 1595			**£6**
P115 for KX-P1180	**£7**	**P145** for KX-P1124	**£7**
P140 for KX-P1540	**£8**	**P155** for KX-P1624	**£8**

Colour Ribbons for KX-P1081, 1592 & 1595
Brown, Blue or Red **£9 each**

Professional Printer Stand



The professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and re-fold compartments ie. one above the other, the desk space required for your printer functions is effectively halved. Its ergonomic design ensures smooth paper flow and automatic refolding.

80 Column version £24 (carr. £3)
132 Column version £29(carr. £4)

Universal Printer Sharers/Changer

Connect up to 5 Micros to 1 printer or 5 printers to 1 Micro with our combined, Sharer/Changer switch boxes.

Standard Low Cost Type

Connects	Serial	Parallel
• 2 to 1	£10	£11
• 3 to 1	£13	£14
• 4 to 1	£16	£17

Professional Type

Connects	Serial	Parallel
• 2 to 1	£17	£18
• 3 to 1	£22	£25
• 5 to 1	£34	£38

Cables extra at £6 each

2 Way Compact Printer Switch

A handy 2 way printer switch can be attached to the micro or monitor for ease of use.

• Centronics **£18;** • Serial **£17**
(Cables extra at £6 each)

Auto Printer Sharer Switch

Connects	Serial	Parallel
2 to 1	£40	£45
4 to 1	£62	£49
8 to 1	–	£89

256k Multi Spooler

These Auto Parallel Printer Sharers have built-in 256K of Printer Buffers. They can be used as Auto Sharers, Printer Buffers or both.

• 2 In/2 out	**£135**	• 4 In/2 out	**£169**
• 8 In/1 out	**£199**		

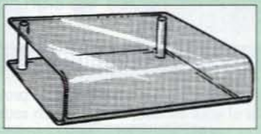
Compact Converter Units

Serial to Parallel	**£36**	Parallel to Serial	**£37**

Laser Direct

• Laser Direct Qume 6ppm complete	**£749**
• Special High Res Card 600 DPI for Canon LPB 4 & LPB 8 Laser Printers	**£315**
• LPB 4 Printer plus High Res Card	**£875**
• LPB 8III Printer plus High Res Card	**£1275**

Perspex Printer Stand



Give your Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version	**£16** (carr £3)
136 Column version	**£20** (carr £4)

Continued→ → → → → → → → →

QUEST MOUSE Mk III

• Quest Mouse III & Quest Paint	£59
• Quest Mouse III, Quest Paint, AMX Stop Press & Pagefont	£89
• Quest Mouse III only	£30
• Quest Paint Software only	£34
• Quest Font Disc (22 Text Fonts)	£15
• Quest Mouse Mat (Red or Blue or Green please specify)	£3
• Quest Colour Dump Disc – This new software allows you to print direct from Quest Paint to your Integrex Colour Printer	£18

(P.S. Quest Paint is not compatible with BBC Compact)

Quest Paint is the winner of the BBC Acorn User 1990 Award for the Best Art/Graphics software

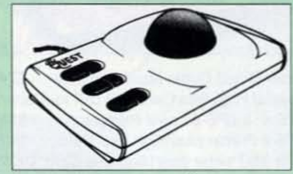
ConQuest

Quest combined with ConQuest and Acornsoft GXR ROM make up THE MOST POWERFUL drawing packages available for the BBC range. Quest Paint is able to take advantage of almost any additions to your machine, such as Shadow or Sideways RAM. ConQuest takes this principal even further, by utilising the otherwise normally incompatible Sideways RAM facility by holding pictures in them.

ConQuest ROM Package £30
(Price includes software in ROM and a comprehensive Manual).
(Not Compatible with BBC Compact)

Quest – Tracer ball

An attractively finished, extremely reliable, mouse replacement, input device. Requires very little desk space. Connects directly to your BBC B, BBC Master or Archimedes Micro.



QT-10 BBC/Master Version	**£25**
QT-20 Archimedes Version	**£26**

Mouse Cleaning Kit

To obtain trouble free operation and prolong the life of your mouse, the high tech rodent requires regular cleaning. Our deluxe mouse cleaning kit is ideal for the purpose **£3**

Mk II Light Pen

Ideal for BBC B and Master. Price includes software on disc and operating manual **£17**

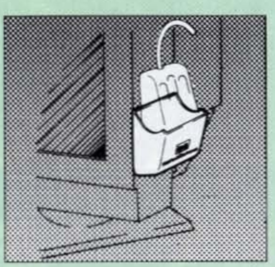
Mk III AMX MOUSE

• AMX Mouse plus Super Art £54

(Please specify for BBC, Master or Compact)

• AMX MOUSE ONLY	£29
• AMX SUPERART Package	£29
• AMX STOP PRESS – A Desktop publishing software. Works with Keyboard, Joystick or a mouse	£25
• PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker	£13
• AMX DESIGN (ROM)	£34
• AMX XAM Educational	£15
• AMX EXTRA EXTRA	£16
• MOUSE MAT	£3

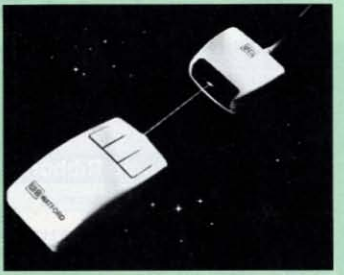
WE Mouse House



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive etc.

Only £3

Archi Cordless Mouse



Features

- Infra Red Signal Transmission
- High Resolution 200 DPI
- High Tracking Speed of 600mm/s up
- Anti-static Silicon Rubber Coated Ball
- Low Friction Teflon Footpads
- Power - by two AAA size batteries (not included)
- Automatic Standby Mode after 5 seconds inactive
- Auto Power Shut-Down after 20 seconds inactive

Price £59

BEEB VIDEO DIGITISER

"Test Bureau Approved for Use in Education"

Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro. This uses the full graphics capacity of the BBC micro in modes 0, 1 or 2. The video source may be a camera, video recorder or television, and is connected via the video output socket. The software supplied includes a sophisticated, fast screen dump routine.

Images produced can be compressed, stored to disc, printed on an Epson compatible printer, directly used to generate graphics, analysed for scientific and educational use or converted to other formats e.g. Slow Scan TV or receiving a picture from a remote camera using a modem. The output from the digitiser exactly matches the graphics capability in each mode, with up to 8 levels of grey in mode 2. The unit connects into the User Port and automatically scans a complete picture in 1.6 seconds.

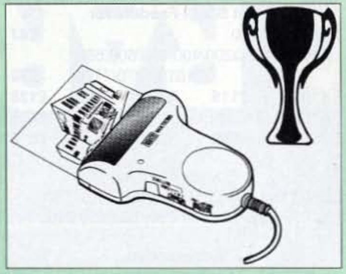
£99

(BBC B+ and Master compatible, except Master with Econet)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual)

Beeb Hand Scanner

Hand-held Scanner for the BBC Micro



Watford Beeb HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs!

The HandScan plugs directly into the 1MHz bus on the BBC while a comprehensive set of utilities provided by the sophisticated ROM firmware. The scanner has a resolution of either 100 DPI or 200 DPI when accuracy is essential. Pictures as wide as 4" may be scanned in mode 0 and various types of dithering may be selected to simulate the grey levels of a scanned picture.

All necessary software has been included in the firmware to allow the scanner to read images directly into our Wapping Editor with little more than the click of the mouse. The digitised picture may then be incorporated into your magazine, newsletter, report or any other document.

Beeb HandScan & Firmware **£99**

WAPPING EDITOR
"MIGHTIER THAN THE QUILL"

Winner of the BBC Acorn User 1990 Award for the Best DTP/Word Processor

The Wapping Editor

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Included with the system is a utility disc containing several high quality fonts, various utilities and a ROM image of a Support ROM. A comprehensive 100 page manual completes the package. The Support ROM contains routines to allow an area to be rotated to any angle or distorted to any four-sided shape. Also included are facilities to draw ellipses at any angle and sectors, segments and arcs (in Master or BBC B with Acorn GXR). Another of the features of the Support ROM is a 'Turbo DFS' which gives DFS access times comparable with those of ADFS.

Page Layout Section

The Wapping Editor may be used to create pages of any size from an A6 to a full A3 page. If none of the eight default page types suit your purpose, the stand-alone page creation program may be used to create pages to your own requirements. By using proportionally spaced fonts and genuine microspacing it is possible to print over 150 characters across an A4 page. A unique feature of the Wapping Editor is the 'A5 x 2' page size allowing two A5 pages to be printed side by side onto a single A4 sheet.

The graphics module incorporates the facilities like: pencil, brush, airbrush, polygon, circle, eclipse, fill, cut & paste, etc.

Text may be typeset, either justified or unjustified, in any font anywhere on the page. Simply select which font and text document you wish to use, and pull out a rectangle on the page where you want the text to be – it's as simple as that! Multiple columns may be printed just as easily and a special 'expand' feature may be used to expand the microspacing so that the document exactly fits the space defined.

Word-Processor

The integral word processor is the ideal tool for producing your text documents, although text can of course be read in from any of the other popular word processors such as View, Wordwise etc.

The Font Editor

The font editor module will allow you to design your own typefaces or to modify the ones provided on the utility disc. This sophisticated editor has numerous functions designed to take the tedium and frustration out of producing good looking, well balanced fonts. Each character may be individually proportionally spaced and characters of any size up to 16 x 16 pixels may be defined.
Pictures may also be 'grabbed' from a video source by using the Watford BEEB Video Digitiser.

Wapping Editor Software Pack	**£59**
Wapping Editor plus Mouse	**£79**

(Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

Wapping Art Disc

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc.
Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out.

Music writing symbols in the form of pattern and brush for quick production of manuscripts are included together with staves.

There are two prepared hi-res pages layed out for printing labels, both single and double width. Ready made label designs are included but these can be easily replaced with your own designs.

A Mode 0 screen dump routine is also included. To pack such a large amount of data onto the discs the screens have been compressed and routines to compress and expand Mode 0 screens are included on both discs. Using the packing routine you can archive large numbers of screens onto a single disc.

£15

Wapping Font Disc 1

Sixteen additional fonts, including smaller version of Oberon and Daisy and two new sizes of the standard font for the Wapping editor.
Also included are three Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines.
Supplied complete with instructions.

£12

Wapping Font Disc 2

This new addition to our Wapping range of DTP software provides you with additional 23 fonts for the Wapping Editor DTP pack. (80 track discs only).

£13

Archi A4 Scanner

This most advanced Archi A4 image scanner is supplied complete with ROM based podule software. Features provided include facilities for zooming in on an image and inverting the image in X and Y directions, saving and printing of the sprite created. Interactive help is supplied using the !HELP application on the Acorn applications discs.
The 216mm scanning width can cope with both desktop scanning of single sheets, photographs, diagrams, etc., with its fast ten page automatic document feeder, but it can also detach from the feeder to become a convenient hand-held full page scanner for larger documents or pictures.
Scanned image control can be freely adjusted in increments of 10 dots per inch from 100 up to 400 dpi resolution with 64 levels of grey scaling. A built in shading controller and manual brightness control achieve optimum image clarity.
Unlike some scanners, which use a red light source, the Watford scanner uses a yellow/green source which vastly improves the light/dark contrast, thus eliminating the effect where any red-based colours are faded down to white and so do not show up in the scanned image.
All these features and facilities combine to make the Archi Page Scanner the fast and convenient way in which to add that extra impact, interest and clarity to documents, reports, instruction sheets, manuals, news letters, etc., from your Archimedes DTP package.

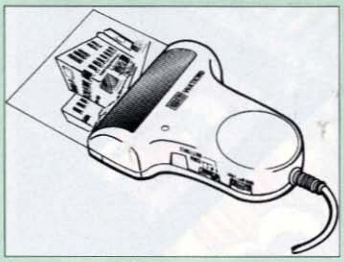
New Low Prices:

Archi A4 Scanner	£269
Sheet Feeder for above	£75
Scanner + Sheet Feeder	£359

Computer Concept Scanlight

• Scan-Light A4	£275
• Scan-Light A4 + Sheet Feeder	£368
• Scan-Light Junior mono	£130
• Scan-Light Junior 256	£197

Archi Mk II Hand Scanner



Watford Electronics is now able to offer a complete hand held scanning package, possibly the most essential addition to any desk top publishing system, for only £119. The package includes the most comprehensive utility software available for the Archimedes, a high quality hand held scanner, and all necessary documentation to get you going straight away.

SCANNER

The scanner is capable of scanning up to an amazing 400 dots per inch (DPI)! The scanning area is 4" wide, and the height is only limited by the maximum amount of memory available. The dot resolution may be switched to 100, 200, 300 or the maximum 400 dpi. One of four operating modes may be selected offering either pure monochrome scanning, or one of three grey level modes. The grey level modes use different size dither patterns to represent up to 16 shades of grey. There is also a dial to allow the "brightness" to be adjusted over a wide range, in order to optimise the quality for any specific image. The scanner interface is a standard, single width, expansion card (podule) which plugs into the Archimedes' backplane. The socket on the rear panel connects the scanner by 1.8 metres of cable.

SCANNER SOFTWARE

Full use is made of the windowing and the multi-tasking facilities of RiscOS. The software is supplied in a 64Kbyte ROM located on the interface board. The scanner appears as a small icon on the desktop icon bar, and the software is retrieved from the ROM simply by clicking on that icon. As you scan a page, the image appears in the scanning window on the screen, scrolling up in real time. The other facilities included in the software are.

Cropping and scaling to any size including stretching and squashing in X and Y direction separately.

Colour tinting.
X and Y flip.

Edge detection which turns solid objects into outlines.

Selective directional copying which allows features (i.e. lines or text) to be made thicker or thinner.

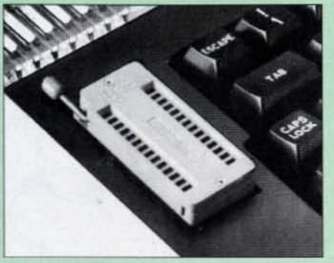
Scanned images may be saved as sprite files or transferred directly into other RiscOS applications (DTP, Draw, Paint) simply by dragging the sprite file into the application's window. Sprites may also be generated using anti-aliasing. This greatly improves picture quality and is particularly effective when scanning material with a range of grey tones, such as photographs. Images can be printed on any printer that is supported by a RiscOS printer driver, with optional settings for portrait or landscape modes, image scale and positioning. Images are printed using the full resolution of the printer and are not limited to the screen resolution.

On-screen help is provided via the RiscOS interactive help facility. Calls are also provided in the ROM for users wishing to write their own software, incorporating the use of the scanner.

AHS-4 Archi 300/400 Version	**£119**
AHS-3 Archi A3000 Version	**£129**

Continued→ → → → → → → → →

Sideways ROM ZIF Socket System



Allows you to change your ROMs quickly and efficiently, without opening the lid. The ZERO INSERTION FORCE (ZIF) socket is located into the ROM Cartridge's position.

- Very simple to install. NO SOLDERING required. The ZIF eliminates the possibility of damage to your ROM pins when inserting & extracting.
- The low profile of the socket allows unrestricted access to the Keyboard.
- We also supply a purpose designed see-through storage container with anti-static lining, allowing you to store up to 12 ROMs, protecting them from mechanical and static damage.
- BBC, B and B+ compatible.

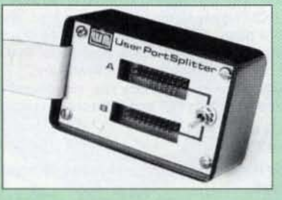
£18

ROM Cartridges for the BBC Master

Will also accept the new larger Piggy Back ROMs like: Interword, Interbase, Quest, Conquest, etc

Twin **£8;** Quad **£13**

User Port Splitter Unit



Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows two units to be connected to the User Port simultaneously, and select between them simply by toggling a switch. This device is particularly useful for those people using Quest Mouse and the Watford Video Digitiser or any similar combination

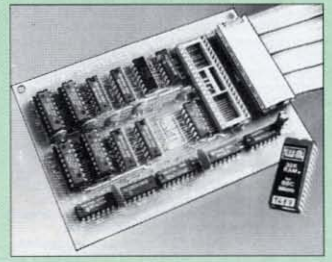
Excellent Value at **£22**

Aries B-488 IEEE-488 Interface Unit

The Aries-B488 is an interface unit to enable the BBC micro to control and monitor IEEE-488 bus systems. The IEEE-488 bus (also known as the 'GPIB or 'HP IB') is the standard method of interconnecting programmable laboratory instruments and control equipment. Using the B488, up to 15 devices may be connected in a single high-speed data network.

£238

32K Shadow RAM/Printer Buffer Card Expansion Board



A MUST FOR WORD PROCESSING

Simply plug the ribbon cable plug into the 6502 socket and gain a massive 32K of extra RAM.

- While word processing, you don't wait for a slow printer, type in text while printing and save on expensive printer buffers.
- "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28K bytes free – 5 times as much as normal.
- In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.
- Combine GOOD GRAPHICS and LONG PROGRAMS. Use the top 20k of the expansion RAM as the screen display memory, leaving all the standard BBC RAM free for programs. Benefit from MODE 0/1/2 graphics and 28k of program space.
- Use the full 32k or the bottom 12K of the expansion RAM as a printer Buffer. (P.S. Only 12K printer buffer can be used with Wordwise & WW+, due to the way they are written):
- Unique facility to turn ROMs off and on again.

Only £54

(Price includes a comprehensive manual and the ROM)

- ARIES B-32 Shadow RAM Card £55

Commander Joystick

Watford Electronics' new Commander Joystick for the BBC B and Master 128K has a unique dual mode of operation giving selective free floating or self centring fully variable control in both X and Y axis directions. Commander is particularly good for flight simulation and drawing programs.

Features:

- Direct connection to BBC Analogue input port – no interface needed.
- Fully compatible with all BBC Joystick controlled games programmes.
- Switchable springs allow selection of floating or centring operation.
- Trim adjusters for both X and Y axes for fine centre adjustment.
- Convenient stick mounted fire button with additional base buttons.

Price: £15

ROM/RAM Card

- NO SOLDERING required to fit the board.
- Fully buffered for peace of mind.
- Compatible with BBC micros (not BBC+ or Master).
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).
- Option for 16k of battery backed CMOS RAM (CMOS RAM needs one ROM socket).
- Software Write protect for ALL RAM.
- Read protect for CMOS RAM.
- Separate RAM write register (&FF30 to &FF3F).
- Automatic write to currently selected RAM socket for convenience.
- FREE utilities disc packed with software.
- Large printer buffer.
- UNIQUE fully implemented RAM FILING SYSTEM (similar to the popular Watford DFS).
- ROM to RAM load and save facilities.

The SFS (Silicon Filing System) can utilise up to the full 128k of RAM (with the SFS in any paged RAM) as a SILICON DISC. This behaves as a disc drive, with all the normal Watford DFS features (including OSWORD &7F for ROMSPELL, etc.) to provide an environment that looks like a disc but loads and saves MUCH faster.

PRICES:

• ROM/RAM card with 32k DRAM	**£42**
• ROM/RAM card with 64k DRAM	**£54**
• ROM/RAM card with a massive 128k DRAM	**£89**

OPTIONAL EXTRAS:

• 16k plug-in Static RAM kit	**£8**
• 16k DRAM for Upgrade	**£13**
• Battery backup	**£3**
• Read and Write protect switches	**£2 each**
Complete ROM-RAM card with all options fitted	**£109**

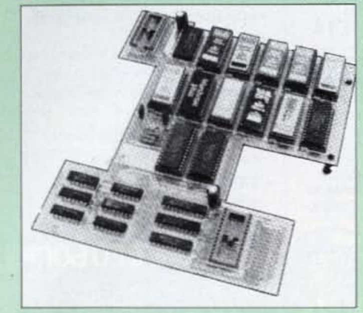
Voltmace Joysticks

Delta 3B Single Joystick	**£10**
Delta 3B Twin Joysticks	**£15**
Delta 3C Joystick for Compact	**£10**
Delta 14B Single Joystick	**£11**
Delta 14B/1 Adaptor Module	**£12**
Transfer Software Disc-Tape	**£7**
Delta-Cat A mouse eliminator Joystick for the Archimedes	**£24**

Delta Base B

Analogue aircraft style yoke Joystick to run in the analogue port of the BBC B & Master 128 **£25**

Solderless Sideways ROM Socket Board



The key features of this no fuss, easy to install card are:

- Increases your BBC Micro's ROM capacity from 4 to 16.
- **No soldering required.**
- Very low power consumption.
- Compatible with Torch, DDFS, RAM Card, 2nd Processor, etc.
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish") allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only £35
Battery Backup fitted **£39**
Battery Backup only **£3**
16K Sideways RAM **£8**

- Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer. **Only: £8**

BBC Educational Software

Maths with a Story 1 (Disc). 4 primary level maths programs	£20.00
Maths with a Story 2 (Disc). 4 further maths programs.	£20.00
Picture Craft (Disc) 6-14 age group. Pack consists of flexible geometrical design & colouring programs.	£17.00
POLYMERS O-Level program.	£20.00
Classification & Periodic Table O-Level. The suite is supplied with its own database of chemical elements which can be classified according to your own rule.	£20.00
ADVANCED TELETEXT SYSTEM	£8.65
PERIOD TABLE SOFTWARE	£20.00
Computers at Work – Primary	£17.35
Electric Fields 6-14 years	£11.25
Espana Viva – 3 Discs	£19.95
WHITE KNIGHT Chess game	£16.00
A Vous La France	£29.00
FUN SCHOOL 2 – Red: Under 6 yrs	£12.00
FUN SCHOOL 2 – Green: 6-8 yrs	£12.25
FUN SCHOOL 2 – Blue: 8 yrs+ .	£12.50
FUN SCHOOL 3 – Red	£18.50
FUN SCHOOL 3 – Green	£18.50
FUN SCHOOL 3 – Blue	£18.50
Six French Games – Aimed at pupils in their first year of French, but also useful as revision for more advanced students 11 years+	£26
More French Games – Another 6 games 12 years+	£26
Au Restaurant and Accident de Route 12 years+	£26
Boulogne and Oh-Les – 2 programs for beginners	£26
Letters to French Penpals – 11 years+	£26
French Programs with Henri Beret – The programs in this series present vocabulary, grammar and role-play phrases in the form of animated games. 11-16	£22
Six German Games – Aimed at pupils in their first year, but useful as revision for more advanced student of German. 12 years+	£22
More German Games – Aimed at pupils in their 2nd year of learning German. 12 years+	£22
An Introduction to Electronics – Brings together all the basic electronics required for a GCSE Physics or CDT course. 14-16 years	£26
Computer Control – This is a package of 3 programs simulating control of a greenhouse, a robotic arm & a chemical plant. 14-16 years	£26
PUNCMAN Learning punctuation	
Puncman 1 & 2 for 7 – 13 years	£15
Puncman 3 & 4 for 8 – 14 years	£15
Puncman 5 & 6 for 8 – 15 years	£15
Yes Chancellor – A chance to take over number 11 at Downing Street. 12 years+	£18
Letters & Pictures – Introduces phonic skills to Infants 6-8 years	£15
Numbers & Pictures – Early number learning is a great fun (4-6 years)	£15
Note Invaders – Budding musicians can learn the notes on the Clef with this elegant game 3 programs (7 to Adults)	£15
Maps & landscapes No. 1 (9-14 years)	£18
Help Your Child learn Basic Map work No. 2 (9-14 years)	£18
Pirate – Educational Adventure (8-14 years)	£15
Spelling Week by Week (6-14 years)	£18

Archimedes Software

Animated Alphabet (3-6 yrs)	£21
Arcventure (8-12 yrs)	£29
Bookbinder	£43
Bumper Disc	£14
Bumper Disc 2	£14
Craftshop 1	£26
Craftshop 2	£26
Converta-Key	£16
Data Word	£16
Desktop Stories	£35
DigiSim	£35
Dream Time (5-7 yrs)	£23
Droom	£19
Farm (5-7 yrs)	£19
Fleet Street Phantom (9-13 yrs)	£25
Fun School 2A Red (up to 6 years)	£12
Fun School 2A Green (6-8 years)	£14
Fun School 2A Blue (8 years +)	£14
Gate Array Teaching System	£68
Glimpse Clip Art Utility (7-16 yrs)	£8
Highlighter (6-16 yrs)	£42
Jiglet	£27
Jigsaw	£28
Mapventure (9-13 yrs)	£24
Microbugs	£24
Money Matters	£16
Nature Park Adventure (7-9 yrs)	£27
Numerator	£60
Picture Book	£16
Recall (6-13 yrs)	£39
Sellardore Tales	£24
Snippet	£26
Space Mission Mada (9-13 yrs)	–
Sting of the Dump (9-13 yrs)	£22
Target Maths	£16
Viewpoints (9-12 yrs)	£33
Wizard's Revenge (7-10 yrs)	£17
Worst Witch (7-10 yrs)	£25

Connecting Leads

(All ready made and tested)

CASSETTE LEADS 7 pin DIN Plug	
to 3 pin DIN Plug + 1 Jack Plug	£2.50
to 7 pin DIN Plug	£3.00
to 3 Jack Plugs	£2.50
6 pin DIN to 6 pin DIN Plug (RGB)	£3.00

Disc Drive Power Leads

Supply from BBC power supply to standard Disc Drive Connection: Single **£3.00;** Dual **£3.75**

Disc Drive Interface Leads

BBC to Disc Drives Ribbon Cable
Single **£4** Twin **£6**

Miscellaneous Connectors

	Plugs	Sockets
RGB (6 PIN DIN)	50p	75p
RS423 (5 pin Domino)	70p	80p
Cassette (7 pin DIN)	40p	95p
ECONET (5 pin DIN)	35p	50p
Paddles (15 pin 'D')	150p	250p
Disc Drive Plug 4 way	100p	–
6 way Power Connector	120p	150p

Watford DATA DUCK

Convert two single Disc Drives into one Dual Drive with this simple external unit (Suitable for Disc Drives with PSU. For Disc Drives without PSU, you will also require Watford Power Duck, see below).

£14

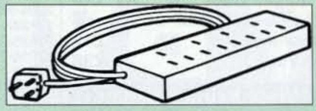
Watford POWER DUCK **£8**

Surge Protector Plug

Fitted in place of your normal mains plug, this device protects your equipment (and data from corruption), against mains high voltage translent spikes/surges caused by lightening or thermostats switching.

Protection for only **£8.50**

4 Way Mains Distribution Socket



4 way top quality mains trailing sockets.
Supplied wired up with mains plug ready for use.
Can be screwed to floor or wall if required.
Very useful for tidying up all the mains leads from your peripherals.

£9.50

Aries Spike Cleaner Unit

A 4 way mains distribution unit as above with a built-in Surge Arrester, providing protection for your complete Computer/Hi-Fi System

£16

28pin DIL Header Plug

SOLDER type **£1.50** IDC CRIMP type **£1.95**

8 Way DIP Switch

Increase the speed of your Disc Drives by soldering this switch to your BBC B or B+ keyboard

Only **£1.00**

28 pin ZIF SOCKET (Textool) **£6.95**

Continued→ → → → → → → → →

Computer Concept's ROMS

Disc Doctor	£18
Inter BASE	£49
Inter CHART	£25
Inter SHEET	£37
Inter WORD	£36
Mega-3 ROM	£76
Spell Master	£42

Wordwise plus

£40

We are giving away absolutely **FREE,** the superb Word-Aid ROM worth £24, with every WORDWISE PLUS package bought from us.

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This advance utilities ROM extends the power of your Wordwise plus ROM.

- Alphabetical sorting of names and addresses.
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- Chapter marker.
- Epson printer codes function key option.
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- Multiple file options for print and preview.
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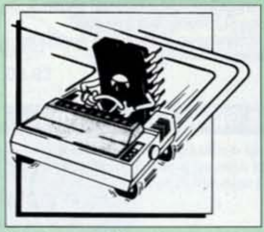
(Please specify for Master 128 or Compact)	
View-Index	£12
Hi-View	£38

View Printer Driver ROM



View is a powerful word processor, but it seriously lacks in terms of printer driver support. With the View Printer Driver ROM, the View users will find themselves in the realms of advanced word processing.

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for BBC B & B+	£12
for BBC Master	£14
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CASHBOOK – A complete "Stand Alone" accounting software package for the cash based sole trader/ partnership business.

FINAL ACCOUNTS – Trial Balance with inbuilt rounding routine; Notes to the accounts; VAT Summary; Profit & Loss A/C; Balance Sheet.

MAILIST – A very versatile program.

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All this for only **£21** (Disc)

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DATABASE – Set up a computerised card index system with powerful search facilities.

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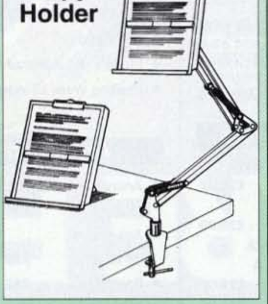

Whether you want to type in your latest program or the draft of a new trilogy, Watford's manuscript holders are superb for holding your paper at the ideal height and angle to allow you to read and type in ease and comfort.

Available in 2 full A4 versions, desk resting and shelf clamping. Paper is held firmly by means of a plastic retaining ruler and a clip grip.

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This extremely useful tool allows you trouble free chip insertion and removal from your computer by distributing the removal force over the whole body of any 24 or 28 pin chip. **£2**

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This king size multipurpose foam cleaner spray is ideal for cleaning Keyboard, Monitor, Disc Drive & Computer furniture surfaces.

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To avoid data corruption and trouble free use of your PCs, it is advisable to clean your PC System once a week. Our Kit 14 is ideal for the purpose.

Kit 14 – 1 each, 3.5" & 5.25" Cleaning Disk, 2 cleaning pads; Drive head cleaning fluid; 20pcs general purpose wipes; Anti-static screen cleaning fluid; General surface cleaning fluid and a transparent plastic case which can hold ten 5.25" Disks when empty. **£10**

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New Release

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Do you have to use both Acorn computers and PC's? Would you like to use your Archimedes or A3000 in PC-emulation mode but are unsure of the new commands?

Although Acorn machines (such as the BBC B, the Master, the Archimedes and the BBC A3000) are mainly used in education, most commercial computers use other operating systems, particularly MS-DOS. As a result school computer users are at a disadvantage when moving into 'business' computing. PCs and other commercial computers use MS-DOS as the operating system, so commands for formatting, copying, backing up, printing and the modem are not the same. Even file names are written differently! And did you know that there is one Acorn command which, if used in MS-DOS, wipes everything in the current directory?

'ACORN TO PC' enables you to change over painlessly. It shows clearly and quicly how, why and where the two systems (Acorn and MS-DOS) differ. As with a foreign language dictionary, you can use the book to transfer either way – from Acorn to MS-DOS, or from MS-DOS to Acorn.

'ACORN TO PC' also acts as a handy reference guide to all Acorn star commands and their MS-DOS equivalents. It also has an extensive and readable explanation of the directory tree and hierarchical filing systems in general. Both DFS and ADFS Acorn systems are covered.

'ACORN TO PC' is written clearly and concisely by Dr. John Lockley, who has wide experience of writing and broadcasting. He is currently appearing as a regular contributor on Radio 5, and is co-author of 'The Complete BBC Computer User Handbook'.

Price: £12.95 (No VAT)

The Complete BBC Computer User Handbook

If you own a BBC B, B+, Electron, Master 128 or Master Compact, or Archimedes, then this is the book for you. It shows how to get the best from your machine, and how to make it work for you. The general style and level of presentation means that both the expert and beginner alike will feel comfortable with the quality and quantity of the material.

Subjects covered include the general use of computers, hardware design and peripheral devices like printers, disc drives, etc, and Networking. Programming hints and tips and various disciplines for making a better program are discussed in some detail, including debugging of specific errors. Standard programs are covered, such as wordprocessors, spreadsheets, databases, graphics, communications, etc., which brings you neatly on to the subject of using computers in the office or at work – even giving advice on writing and marketing your own programs.

A book you will enjoy to use as a reference, or read from cover to cover, over and over.

Only: **£14.95** (No VAT)

The Complete Mouse User Guide to BBC Micro

This manual has been written to reveal the secrets of the mouse. It explains all the principles required by the hardware and associated software, and also example listings for inclusion into custom programs. The manual first details the basic principles of the mouse and a simple program which uses these principles. This information should be adequate for most applications. However, it is possible to improve the performance of the mouse by expanding on the principles already used in the software. This is again fully explained and an example program given.

It is possible to gain a full understanding of the mouse from this manual. For those not interested in exactly how the mouse functions, complete example programs are also included.

Price £5.95 (No VAT)

Example programs on Disc £4.95

Beeb PC (BASIC)

Designed for program authors to convert BBC programs to run on IBM PCs.

Price: £38

Beeb DOS 3.0

(Now reads Archimedes Discs)

Beeb DOS is a collection of utilities which run on the PCs and enable it to read and write information on BBC Discs.

Price: £39

The Epson RX/FX/KAGA Printer Commands Revealed Handbook

So you bought yourself a new printer, because the salesman in the shop showed you how clever it is and impressed you with all sorts of printouts to show its capabilities – he may even have offered you a special price.

However, now that you have got it home and connected it to your BBC microcomputer, you are wondering how to make it perform these magical tasks. The manual seems to give no clues, and when you type in the example programs, the computer throws the LPRINT statements back in your face.

Now what do you do, when this £400 piece of high technology refuses even to move its head, and you have stayed up until 2 in the morning with copious supplies of coffee, desperately trying to print something out? Once again, Watford Electronics comes to your help with our new book entitled 'THE EPSON FX-KAGA PRINTER COMMANDS REVEALED'.

This book describes in plain, easy to understand English, how to use and make the most of your KP810, PW1080A or any other Epson FX80 compatible printers like Panasonic KX-P1080/1, etc., with the BBC Micro, both from Basic and Wordwise.

£5.95 (No VAT)

Continued→ → → → → →

Hi-Speed, Low Cost Archi Hard Disc Drive

Watford's advanced interface allows IDE drives to work on any Archimedes machine, speeds in excess of SCSI devices can be obtained at a fraction of the cost of a SCSI drive.

Up to four drives are supported by the IDE filing system IDEFS, up to two drives can be attached to each expansion card, up to four cards can be installed in a machine. An optional 20Mb or 40Mb hard disc can be supplied on the podule expansion card itself, with its fast transfer rate and power saving modes the drive is ideal for storing commonly used software such as the !Fonts application.

A powerful security feature has been provided with the two unique commands *IDELock and *IDEUnlock, ideal for educational establishments where hacking or tempering may be prevalent that may lead to loss of data. Once locked, the configuration can not be changed until a secret password is used. The !IDEForm Write Protect option is particularly useful in conjunction with *IDELock as it will prevent any unauthorised deletion of data.

By an innovative use of on-board memory, the card will remember its configuration, even if moved to another slot or even a different machine, this also includes the unique security features.

Hardware

- Single width EuroCard
- Supports proposed ANSI ATA (IDE) specification
- Fast 16 bit MEMC interface interrupt driven to support background disc operations
- 5 Mbytes per second peak transfer rate
- Built in Non Volatile RAM to hold configuration
- LED activity indicator
- 37 way D type socket for external drives
- Optional on-card 20Mb or 40Mb hard disc
- Up to two drives (master and slave) per card
- Multiple cards per machine (up to four)

Software

- Conforms fully to the Acorn IDE Specification
- All software supplied in ROM
- Filing system 'IDEFS'
- Desktop filer with drive ready detection and disc name under icon
- !IDEForm, WIMP based configuration and formatting software
- Drives can be individually write protected
- Up to four drives over multiple cards
- Power saving standby modes supported with configurable timeout
- Drives can be used without translation in native mode for minimum overhead
- !IDEFSDisk, creates PC emulator hard discs

Prices

Part No.	Capacity	Access Speed	Price
ADA 0520	44Mb	28mS	£249
ADA 0530	100Mb	16mS	£379
ADA 0570	200Mb	15mS	£499
ADA 0580	330Mb	15mS	£895

All the above 3.5" hard drives are supplied complete with Controller Card, cable & Software on ROM. (Internal fitting). For use with A300/A400/A500 series machines.

For A3000 users an additional external Case and PSU will be required.

AAA 0300 External Case & PSU for A3000	£85

Internal Hard Disc Drives for A3000

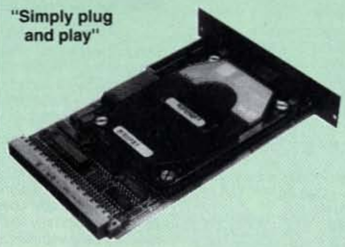
State of the art, 4 layer internal IDE Hard Cards for the A3000. Software supplied in, On-board ROM.

ADA 0700	21Mb	23mS	£185
ADA 0720	44Mb	19mS	£385
ADA 0750	60MB	18MS	£425
ADA 0730	89Mb	18mS	£685

Supplied ready assembled. No soldering required. Simply plug into the alloted space.

Archi IDE Hard Cards

"Simply plug and play"



Watford's NEW low cost, high performance revolutionary IDE Hard Cards for the A300 and A400 series Archimedes are unbelievably easy to install – you simply slot one into any vacant podule backplane slot in the rear of your computer. These stunningly engineered, light weight but fast, 2.5" miniature hard drives are mounted onto the professionally designed cards, and are supplied with the fully Acorn-conformant IDE Filing System ready installed and ready to run. A novel feature of the hard cards is that they can be easily removed and transported to another Archimedes, for example to make a hard disc backup, or to transfer saved files from work to home etc. Security of files on the hard disc is ensured by our unique security password lock, which allows files to be read only, but not overwritten or deleted – ideal for use in school applications where the integrity of your master software needs to be retained.

ADA 0650	21Mb	23mS	£199
ADA 0660	44Mb	28mS	£375
ADA 0670	89Mb	18mS	£675

(Can be used as a Removable Hard Drive)

NEW Archimedes A300/A400 SCSI Hard Disc Offer

(while stocks last)

100MB Hard Disc Upgrade
complete with Controller card,
Cables, Formatter and Manuals

RRP: £999

Offer Price: £399

CREDIT CARD 24 HOUR
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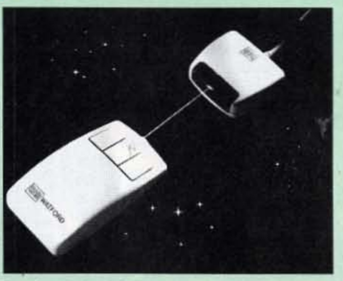
Syquest Removable Disc Units

These Hard Drive units are supplied complete with a cartridge 42Mb removable, cables and a high flow fan for cooling.

• Syquest Drive Unit pack	£399
• As above + SCSI Card	£535
• Spare 42Mb Disc	£55

NEW Archimedes Cordless Mouse



Ever found that using a mouse on a busy desktop has its problems? The cable is always being caught up in papers, tangled round equipment and other cables etc, and what about that cup of coffee spilled over your work!

Watford Electronics' new Cordless Mouse solves these problems by removing the cause for concern - replacing the cable with a simple infra red link. It still provides all the speed and easy control of a conventional mouse, but with complete freedom. In use, there are no operating differences between the standard mouse and the new cordless mouse so all mouse functions and mouse driven RISC software will be fully compatible. Pinpoint accuracy is ensured by a unique Accelerator button, which, when pressed, moves the pointer by just a tiny amount for a large slow movement of the mouse, but by a large amount for a quick wizz of the mouse.

Features

- Infra Red Signal Transmission
- High Resolution 200 DPI
- High Tracking Speed of 600mm/s up
- Anti-static Silicon Rubber Coated Ball
- Low Friction Teflon Footpads
- Power - by two AAA size batteries (not included)
- Automatic Standby Mode after 5 seconds inactive
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Price £59

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Acorn

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Taking your questions to heart, Mike Cook leads you to understanding

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- Hacking
- No CapsLock

It's dead, Jim

I POSSESS an issue 7 BBC Model B with a disc drive, WordWise Plus and Quest Paint. I have had relatively trouble free use for nine years, but I am now experiencing problems.

It suddenly turned itself off with no warning. It was not a power cut since the lights and the TV I use as a monitor were still working. Moreover, the computer would not turn back on. The fuse was not faulty so I removed the cover and checked the PCB for obvious errors.

I saw that the short – purple – wire on the left hand side of the computer between the PSU and the board was bent right over so that it was almost touching the other components.

The original spade connector had broken away from the board a few years ago and I had soldered a short piece of wire between it and the board. I bent the wire back up and was able to turn the computer on.

Assuming that this was the end of my problems, I replaced the lid. However, the BBC only worked for another four hours – on and off – before cutting out again.

I removed the lid again and found that I could turn the computer on, though I did nothing inside except the usual pressing of chips and so on. This time I left the computer switched on to see if it shut down of its own accord, but two hours later it was still fine.

The next time I used the machine I left it for half an hour, but when I returned to it, it had cut out. Removing the lid yet again, I discovered that the -5v purple lead was free from the PCB haven broken at the joint with the board.

Unfortunately, despite soldering the wire back into place I cannot get the BBC up and running even though I have verified its connection to the board using a continuity meter.

The power supply makes an audible click on a nearby radio when first turned on so could it be the -5v lead or is it another factor I have not discovered? What would you suggest? – **Jim Broughton, Harrogate, North Yorkshire.**

● *By not turning on, I assume you mean that there is no signs of life like the caps lock LED on the keyboard. If this is the case the culprit is your power supply.*

As well as a fuse in the plug there is one inside the supply, first check both. However, your adventures with the -5 volt line might have been the cause of the damage.

You see this line is only needed for the sound chip and the serial interface and the computer will work quite well without it being connected.

But if it accidentally makes connections to earth or +5 volts it can cause the power circuit crowbar to trip. This is a safety circuit that effectively short circuits the +5 volt power supply and so trips the over current protection.

It sounds like you have got away with this for the first few attempts, but now the protection circuitry is damaged and has failed in a safe state, as it was designed to do.

Unfortunately, the power supply is not amenable to DIY repair, as it contains many difficult to get specialised components.

Also errors in mending them can ➤

No capitals

I HAVE a problem with the caps lock key on my Archimedes 410. It is no longer possible to toggle the key on and off, I can only change its status via the !Configure application.

Is this a problem with the keyboard or is it a software problem – any help would be appreciated? – **George Cotsikis, South Kensington, London.**

● *Unfortunately this sounds like a hardware problem. The keys make contact with some gold plated pads on the main printed circuit board and these get clogged with dust.*

The solution is to remove the keyboard and clean it. However, don't use switch cleaner or other solvents as this will dissolve the plastic that makes up the keyboard. As the caps lock is close to the end, it might respond to having the screw close to it tightened. If not, loosen off this screw and try blowing or brushing away the dust.

If this fails then carefully dismantle the keyboard and clean the pads with some IPA – Iso-Propyl alcohol – on a cotton bud, making sure to only clean the gold parts.

Monitoring experience – and a word of warning

I HAVE at my disposal a Samsung monitor and I would like to know if it would be possible to connect it to a BBC computer – a Model B or a Master?

The only information I can give you is that it appears to be a white/black screen. The only controls visible are on/off, brightness and contrast. It does require 240v of power and has a 9-pin D plug, but only pins 6 to 9 inclusive are present.

If this is at all usable can you tell me how I should connect it to my system? – **L.J. Fowl, West Croydon, Surrey.**

● *As I do not have the circuit of your monitor I can't tell you what connections to use. However, in general a black and white TV can be used as a monitor providing it is isolated from the mains. This usually involves having an isolating transformer driven power supply as opposed to an auto transformer.*

If this is so, you can inject the signal from your computer after the signal rectifier diode at the end of the IF strip.

As this requires internal modification of the TV set it is best done by a qualified service engineer. He would also be able to tell if these signals can be derived from the socket on the back of your set.

Dealing with the inside of TV sets can be hazardous if you don't know what you are doing and an engineer should only charge a nominal fee for looking at it.

S
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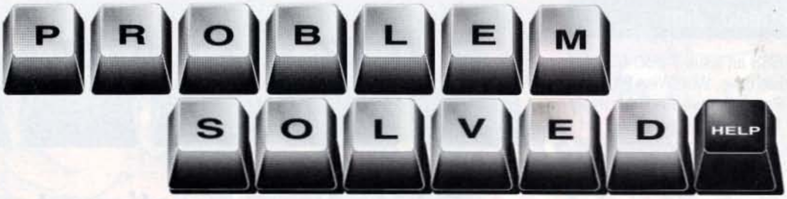
HELP

prove fatal, so your only recourse is to get a replacement from an Acorn Service Centre.


P R O B L E M
S O L V E D
HELP

Speak to the world

HAVING an A3000 and being interested in communications, I wondered if you could tell me what I need to get started, the type of prices it'll cost me for phone bills, bulletin boards and the benefits of Prestel and CompuServe.

In fact, what are these services and do I need them? I am also confused by the terms V21, V23 and Bis. I recently heard of packet radio which I have been told is a lot like modem communications but without having to pay the phone bills as it uses the airwaves.

Could you explain these terms as well as let me know about bulletin boards from which I can download PD through the packet radio? Also how much would it cost in software and hardware? Finally is it possible to run my own bulletin board? – **Alex Howarth, Bow, Devon.**

● *With an A3000 you first of all need a serial interface fitting, then you need to buy a modem to go between your computer and telephone. The V numbers tell you what type of modem it is, and at what speed – baud rate – it will work. They generally go in order V21, V23, V22, V22bis so that the V22bis can normally be made to work in any of the other modes. Then you need some communications software such as Hearsay, ArcComm or ArcTerm.*

For starters you should get a low-cost V21/V23 modem, that will allow you to access CompuServe and Prestel. These are subscription systems that have information and files as well as electronic mail. You usually have to pay a subscription charge, a connect charge and, of course, your telephone bill.

In addition some systems, like CompuServe, also have a carrier charge so that you can use only a local phone call to access a computer that would otherwise require a long distance call.

In addition to these there are many free bulletin boards where you only have to pay for your phone bill. The more expensive V22 and V22bis modems will allow you to access these systems four and eight times faster. This saves on bills especially if you do a lot of downloading of files.

Packet radio is a similar operation conducted over the radio, usually in the VHF region. There you can send messages and download files, although much of the information is radio-oriented. At first this might sound an attractive option, but first you have to have an amateur radio licence, which costs £15 a year.

However, before you can obtain one you have to hold a City and Guilds Amateur Radio Certificate. This is a multiple-choice exam paper covering radio fundamentals and licensing conditions. This is taken in the Spring so you should enquire at your local adult education college for information on courses starting in September.

Then, having got that you need a transmitter, packet interface and aerial. You don't get much change out of £600 and you could spend much more.

Maximum sample lengths?

I HAVE been particularly interested in your recent Body Building series on the sound sampler as I have been looking for an economical way to be able to store and playback sounds through the computer. I was hoping to be able to use the software as a store for sound effects, as in some cases it would overcome some of problems associated with cassettes.

The problem is that I am unsure what the maximum possible sampling time is – how long can the sample be? I would need to be able to sample for at least six seconds. Can you help? – **Robert Lawrence, Cheltenham, Gloucester.**

● *You don't say what computer you have, so it is difficult to give you an answer. However, for a 1Mb Risc OS computer you can get about 45 seconds of sound with the software provided. On an 8-bit machine you would need 30k of memory to get six seconds.*

While this much memory is in the machine, you need some for other uses. The maximum practical time is therefore about four seconds. But, if you have extra memory you could re-write the software to use it.

Interfacing the problem

I HAVE a Hewlett-Packard Plotter, a model 9872A, IEEE4.88 and I would like to connect it to my A3000. What do I need and where should I start? – **G. O'Brien, Harrow.**

● *What you need is an IEEE podule to interface between your plotter and computer. These are not cheap and it may pay you to sell the plotter and buy one with a conventional parallel or serial interface.*

Intelligent Interfaces (0789 450925) sell an IEEE-488 interface card for £299. This includes interfacing software for driving the device from Basic. They also sell interface library support routines for ISO Pascal, ANSI C and Fortran 77.

Are you game?

HOW can I swap pre-recorded games from tape to disc, if they are locked. Disc Doctor has an option to lock or unlock a disc, but trying the *TapeDisc option to copy from tape to disc fails when it comes to a locked part. Can I get over this?

I would also like to know what a Communicator Rom does. Finally, is there any way of getting rid of the high pitched bleep on Superior Soccer which sounds every time the ball goes off the pitch? – **Roger Cook, Newchurch, Lancashire.**

● *The problem here is that the games programs are protected as the designers don't want anyone copying them – it is also illegal. As a result programmers came up with all sorts of cunning wheezes to stop you .*

At the same time other programmers developed utilities tried to counter these problems, with various forms of tape to disc utility. The bottom line is that there are some protection methods that you can't circumvent automatically without altering or hacking the code.

This is not a case of typing in an odd command but rather disentangling the knot the writers have tied. As this is an illegal activity you'll get no more about it from me.

Similarly with Superior Soccer, the writer probably thought the sound was a pretty neat idea and so provided no way of disabling it separately.

I can tell you though, that a Communicator Rom is a terminal emulator package that will allow you to contact bulletin boards if you have a modem – you'll need to get documentation from somewhere.

Sounds interesting

DOES anyone know of a company that still produces sound expansion cartridges for the Electron, as I would like to hear some of those PD tunes in their full glory?

In the October Letters page Phil Bender wrote that you could add 16k of sideways ram to the rombox by adding a 62256 chip. Can you tell me the difference between a 6225ALS-15 and a 62256P-12 – apart from about £2? – **P. Wright, St Neots, Cambridge.**

● *There was a sound expansion board for the Electron but I don't know who produced it or if they are still going. Can a reader help?*

The number at the end of the chip refers to the access time, that is the maximum time it takes from addressing the chip to when the contents pop out. It is likely that the -15 will be 150nS and the -12 will be 120nS. For the Electron it doesn't matter which you use.

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How to succeed in games and influence people

- Vertigo
- Lemmings
- Air Supremacy
- Hyperball
- BugHunter and BugHunter in Space
- Master Repton Infinity
- BBC/Electron games compatibility
- Citadel

WELCOME to another round of all that's best in the games world. This month's column seems to have been infiltrated by lists of passwords, but there should be plenty to please those of you who don't like multi-level games. On with the show.

It's all over now ...

In the last column I featured a couple of tips for Krisalis' **Lemmings** which arrived courtesy of Eileen Godfrey of Milford, near Godalming.

I'm sure that they will have helped many near-suicidal lemmingers. But for the less determined I now present the full set of passwords for all 120 screens:

Fun	Tricky	Taxing	Mayhem
1: FUN	1: KELLIESEYE	1: SEEITTONON	1: NEARLYGONE
2: DINKIEDOOS	2: SINGLEDECK	2: JUSTFORYOU	2: LEMMINGDUE
3: WHENYOUSEE	3: LOOKANDSEE	3: RUNANDFLEE	3: SPENDSPREE
4: OPENSADOOR	4: MANYANMORE	4: DOORTODOOR	4: ONTHEFLOOR
5: LEMMSALIVE	5: CANSURVIVE	5: STILLALIVE	5: UNCLECLIVE
6: ONESINAFIX	6: LEMSBRICKS	6: FIXEDMYFIX	6: WAITANWAIT
7: LUCKYSEVEN	7: WALKINGSTK	7: ANUNEBEVAN	7: DIFFERENCE
8: ONEFATLADY	8: DONTBELATE	8: HELPMEMATE	8: WAITANWAIT
9: WASHINLINE	9: DOINITFINE	9: DRINKNWINE	9: EATANDDINE
10: JMAJORSDEN	10: LEMMSAGAIN	10: TENPERCENT	10: TENTONTESS
11: LOVELYLEGS	11: LEMMINLEGS	11: STICKUPTWO	11: BINISTHREE
12: JUSTADOZEN	12: ONTHESHELF	12: DIGINDELVE	12: TWOTIMESIX
13: UNLUCKYYOU	13: YOURINLUCK	13: HISBADLUCK	13: RETURNTOME
14: ATENANFOUR	14: FOURTEENIE	14: TEENSFORTH	14: TWICELUCKY
15: THREEFIVES	15: FIVETEENIE	15: TEENSFIFTH	15: NINEANDSIX
16: VERYSWEETY	16: SUGARLEVEL	16: NOTSOSWEET	16: CHARITYNUM
17: SEVENANTEN	17: YEARTOWAIT	17: DRIVEUKCAR	17: STILLYOUNG
18: KEYOFADOOR	18: AGECANWAIT	18: VOTESFORME	18: COMESOFAGE
19: LASTEENAGE	19: LESSTWENTY	19: TENSTONINE	19: OLDERSTILL
20: SECONDSCOR	20: TOTIMESTEN	20: DOUBLESTEN	20: NUMBTWENTY
21: TODAYTODAY	21: HALFANSWER	21: LOCKANDKEY	21: OLDERLEMMS
22: DOUBLEDUCK	22: DUCKSTWICE	22: TWOELEVENS	22: LEMMINDUCK
23: TWOANTHREE	23: ONEISFORME	23: JUSTFORME	23: SOONBEFREE
24: SENTRYDOOR	24: PLAYINMORE	24: LEMMINMORE	24: LEMMSSTORE
25: QUARTERTON	25: LEMMSTRIVE	25: JIVEANJIVE	25: LEMMSDRIVE
26: THISISAFIX	26: CHOPSTICKS	26: LEMSINAFIX	26: YOURINAFIX
27: LOWINDEVON	27: ALUCKYDUCK	27: LEMSHEAVON	27: LEMTODEVON
28: SELLBYDATE	28: SHUTMYGATE	28: GARDENGATE	28: TWOSTOPLAY
29: GOLDENLINE	29: WOTSMYLINE	29: STANTOWINE	29: ONEAFTERME
30: DIRTYGIRTY	30: HURRYHURRY	30: FIXEXSIXIS	30: LEMMGFINAL

An easier break

Hyperball is Superior Software's offering on the classic Breakout theme. This version features a cheat facility. To use this wait until the game has fully loaded and you are presented with a screen with a message scrolling along the bottom. At this point press the Delete and C keys, followed by Copy and a key from A to T. You will then find yourself in the appropriate Hyperball arena – 1 to 20.

On and on and on

In the course of a conversation with Pipemania author David Lawrence, he told me of a cheat built into the Master version of **Repton Infinity** also written by him.

To activate this proceed this way. On the main menu position the cursor on option 1 and strike the B key. Put the cursor on option 2 and press A. Continue in this manner through option 3, 4 and 5 pressing keys N, J and O respectively.

Start to play the game by pressing the Return key and before the game starts – difficult on the Master – press the keys C, H, E, A and T. You'll find that you can now select the map using the Control+M combination instead of the normal M and play the game entirely on the map.

No more bandits

Also on the Archimedes, Martin Stevens has sent me the passwords for Superior's **Air Supremacy**:

Level 1	1918	no password
Level 2	1944	SCRAMBLE
Level 3	1991	STACCATO
Level 4	2150	EQUANIMITY

It's a long way down

The passwords for Superior's **Vertigo** – as featured on Play it again Sam 16 and first mentioned in the January 1990 issue – have come to me from the great provider, Steve Hanson of Superior and are as follows:

Disect? I'm sure that's not the way I'd spell it ...

Level 1
1: GRIMBO
2: JINXED
3: CLOSET
4: DISECT
5: HEADER
6: MEADOW
7: CENTRE
8: MEDIUM
9: CASTLE
10: MUSEUM

Level 2
1: RUCHED
2: TROPIC
3: WOOKEY
4: POSTAL
5: TRENCH
6: TINNED
7: BADGER
8: HUBBUB
9: WOWZER
10: DANGER

Level 3
1: HOWZAT
2: ZAZBOT
3: GOTHIC
4: EQUINX
5: ELWOOD
6: BOUNCE
7: GROOVE
8: HUBBUB
9: KILLER
10: HEIGHT

Level 4
1: SPEEDY
2: PURITY
3: GENTLY
4: ARTHUR
5: MRPINK
6: ALMOST
7: MAKING
8: FLIPPY
9: FLOPPY
10: ZAPHOD

Level 5
1: SEQUEL
2: KANSAS
3: MYHERO
4: TRACIE
5: M.L.K.
6: ALWAYS
7: ASKING
8: ACTION
9: THINGS
10: QUINCH

Incidentally, also in January 1990 column, I also mentioned a game by the name of **Destiny** which was due for release around March 1990. I wonder where that went to?

All change now

Almost all modern tape-based games for 8-bit machines feature a BBC version of the game on one side of the tape and an Electron version on the other. These two versions are not generally compatible because most modern games directly access the target machine's hardware in order to squeeze the last bit of performance out of it. This means that the BBC version of a game will not run on an Electron and vice-versa.

However, there are some which contradict this rule – Zenon from Impact Software being one. Robin Jubber of Canterbury tells me that the Electron version works perfectly on the BBC and in Robin's words *zips along* much faster than normal.

Discussing this with Superior's Steve Hanson I discovered that the BBC and Electron versions of MasterBreak work on the other machine. Not only is this feature extremely useful for speed merchants who find the BBC Micro version not fast enough for their nimble fingers, but by reversing the process and running a BBC version on an Electron allows the slower speed to give the game an audience among handicapped and disabled users.

Bug swatting

James Holtom of Chelmsford in Essex has sent me the passwords for Minerva's two Hysteron Proteron games, **BugHunter** and **BugHunter in Space**.

BugHunter	
Levels 1-4	98 ACORN AVENUE
Levels 5-8	23 CASTLE ROAD
Levels 9-16	42 FORD STREET
Levels 17-24	14 BRUMLEY ESTATE
Levels 25+	31 BRUMLEY ESTATE
BugHunter in Space	
Levels 1-4	no password
Levels 5-8	HUMANOID
Levels 9-12	ADAMSKI
Levels 13-16	SUGGS
Levels 17+	POSDNUOS

One point that is puzzling James is the Oxford English Dictionary's definition of Hysteron Proteron, which is: *a figure of speech in which what should come last is put first; an inversion of the natural order.* I put this point to Pat Cleaver of Minerva when I saw her at a recent Watford Electronics Open Day, and she said: *For what was intended to be a six-foot killing machine to turn out as a six-inch creature which a large mouth, isn't that an inversion of the natural order?*

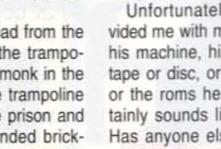
James also says that he would like to see more pokes for the Archimedes machines. As I write from home in sunny Buckinghamshire and my nearest contact with an Archimedes is with a friend's 310, I find it less easy to write cheat routines for the Archimedes series than for the 8-bit machines. Consequently, readers, get hacking!

Return to the Citadel

Although there have been many games that have appeared briefly on the face of the Acorn games scene and moved on into obscurity, there are quite a few that just keep on generating interest and correspondence.

One such is **Citadel** and I continue to be surprised at its longevity and popularity. A lovely letter appeared on my doormat from Sarah Thomas and Matthew McMahon who say that if I can help them with their problems I would make *a dream come true*. Put like that, how could I refuse?

Firstly, there is no way up the mountain – this screen is the most westerly point in the game. To get past the witch you need the skull from the top of the West Tower and the two bones from the East Wing and from the pyramid. Drop all three in the cauldron in the Witch's House and the witch will disappear in a ball of flame as soon as she passes over the cauldron.



To get the pharaoh's head from the prison, you need one of the trampolines. First dispose of the monk in the usual way, then place the trampoline on the pedestal inside the prison and jump up on to the suspended brickwork. Climb up the rope to get the head, which you need with its twin, to get past the mummies in the pyramid.

Last, but apparently not least, to lower the level of the water in the well you must start the well wheel running. You do this by flicking the switch immediately above the wheel. Access to this is gained only after you have found the green and cyan key. Good luck ...

Remaining with Citadel for a moment. Paul Murray of Greenford, Middlesex, seems to be having problems with the actual running of it. He says that when he tries to play it, certain of the collectable items are missing from the game and he has to keep restarting until they appear. Other items, notably the pedestals on which you drop items, do appear but are in the wrong place on the screen. This often makes it impossible to traverse that screen.

Unfortunately, Paul has not provided me with much information about his machine, his version of Citadel – tape or disc, original or compilation – or the roms he has fitted, but it certainly sounds like a hardware clash. Has anyone else experienced these problems?

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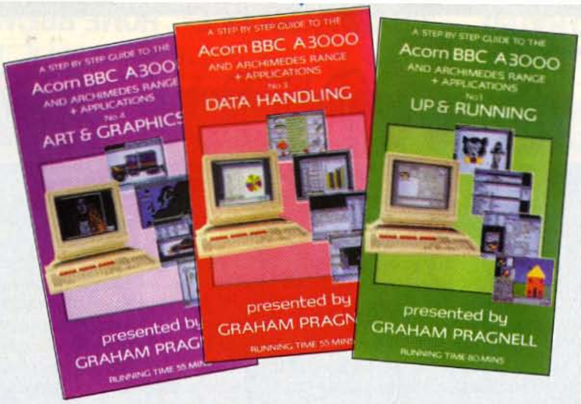
Ready, set, go...

Pam Turnbull takes a look at four videos aimed at making an Archimedes novice's life easier



PEOPLE who have bought a computer for the first time find themselves in a state of awe, excitement and techno-phobia. Manuals and even simple set-up instructions are written by those who understand computers and in some cases have totally forgotten that at one time discs played music and mice were small rodents chased by cats.

By its very nature the Archimedes – BBC A3000 and A5000 – is user friendly and intuitive to use, especially if you have worked on other computers before. The manuals, and especially the Learning Curve packages, are well put together and Acorn produced a short video to help beginners with the basics.

Pedigree Films have produced a set of training videos to take this idea one step further and some Acorn dealers are including the first video – Up and Running – with their Archimedes systems.

Up and Running

All the videos are presented by Graham Pragnell and are professionally produced and deal with their areas in easy steps and at a steady pace. Even if you miss something you can always rewind the tape.

The first video runs for 80 minutes and starts with unpacking the A3000. The aspects dealt with are equally applicable to the whole Archimedes range and even though it uses Risc OS 2, the A5000 owner with Risc OS 3 will still find it useful.

After going through what to plug into where, you turn the machine on and configure it the way you want. The mouse is explained and the Welcome discs explored, starting with Edit.

As with all these videos the basics are covered, but for in depth detail you must return to the manuals. The principles covered here are very useful and are lessons which should be learnt at this stage not later, for instance creating work discs. However, some things are taught or covered in a strange order: While you are told to insert a formatted disc early on, you are not told how to format until later in the video.

There also seems to have been some decision taken not to cover some of the short cuts such as Control+U to delete a default name when saving or opening files with the Adjust button to close the parent window. But to be comprehensive you would not be looking at an 80-minute video.

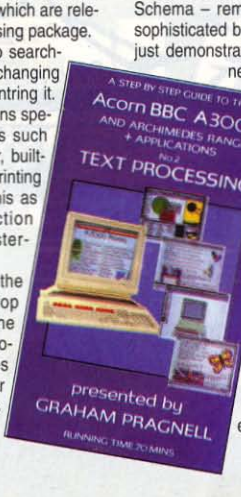
How to find your way around the Desktop, scrollbars, windows, task manager, ram discs, saving, printing, dragging, multi-selection, deleting and copying files are all covered as well as write-protecting your discs. You are taken step by step through Edit, Paint and Draw. The importance of keeping a Desktop tidy is also stressed though not the reasons.

Text Processing

As First Word Plus comes with the Learning Curve package, it is understandable that this is dealt with in some detail. Graham Pragnell takes you through the menus and explains the basics on text input, using the delete and cursor keys which are relevant to any wordprocessing package.

He then moves on to searching and replacing and changing the type to bold and centring it. He also deals with options specific to First Word Plus such as the spelling checker, built-in printer drivers and printing windows. Look upon this as a general introduction though, not as a masterclass.

The second half of the tape deals with desktop publishing and uses the Ascii/plain text files produced earlier in Phases and Ovation. The former is for children and uses simplified ways of changing the type styles and sizes.



I don't think that this is explained enough for a beginner and there is some skimping of detail which could lead to misunderstanding. However, the principles of dragging illustrations and text into a DTP package and frame manipulation in Ovation are simply put and are applicable to most DTP packages.

Data Handling

This video gives a general view of what is available in the market. It starts with the simple DataSweet package which includes databases, graph plotting and spreadsheet programs.

These are gone through in some detail to explain the principles behind these types of programs as well as giving examples as to what can be achieved.

The programme then touches on Schema – remarking that it is more sophisticated but not saying how, and just demonstrates the ability to show negative values in red. It then moves on to the Squirrel database but skims this too, showing nothing of field types or transferring data between packages with CSV files and the like.

Genesis and Magpie are also mentioned, but only as examples of a different type of data handling. There is not enough room in such a medium to deal with multi-media, but I feel more could been achieved by covering less.

Product: A Step by Step Guide to the Acorn BBC A3000 and Archimedes Range and Applications: Up and Running; Text Processing; Data Handling; and Art and Graphics.
Price: £14.99 each
Supplier: Pedigree Films, Unit B11, Trinity Business Centre, 305 Rotherithe Street, London SE16 1EY.
Tel: 071-231 6137

Art and Graphics

The fourth in the series also suffers from some of the faults present in Data Handling. However, it does show the range of possibilities open to new users but in 55 minutes tries to cover too much.

Starting with using a hand scanner to create illustrations, the hardware side and installation are not mentioned and no warnings are given about the size of scanned images or the limitations you might run into with a 1Mb machine.

Paint is used to tidy up images before the programme moves on to cover Revelation, Poster and KiddiCad – three radically different pieces of software – an image processing package, object-manipulation software and a single-tasking 3D animation package for children.

They do all come under the very general heading, but their applications are hardly touched on and I'd only recommend this video as *additional reading* or as an introduction to what your Archimedes is capable of. This is especially true as the film ends with examples, from simple art packages to animation packages and ray-tracing without any explanation.

Summing up

A proper training course will give you the opportunity to ask questions and these videos provide some basis on which to ask those questions. You can learn the basics in your own time and at your own speed in the comfort of familiar surroundings. The best way to learn is still to work your way through a tutorial section, which most well-written software packages provide.

But the true value of these videos is that they will give any novice the confidence to explore.

Rom and Ram

ROM's been agitating Ram all month about going to the pictures and now he's finally given in – sort of. "Instead of going to the pictures Rom, how about making your own?" Rom agrees as long as he can have two sacks of popcorn, an orange drink with a straw and a Zoom – why does the picture card always stick to the wrapper?

If you recall we now know how to place images on screen using those handy indirection operators ! and ?. This swift method of pixel plotting lends itself neatly to displaying images successively in order to produce acceptable animation. Just as in films we can store a number of slightly altered images on the computer and by displaying each in turn we can conjure up some quite convincing animation.

There are two programs to type in this month, one to design and edit your *frames* – Define5 – and the other to run your animated sequence – Animate. Both are just the bare bones so they can be typed in quickly.

So Rom, having waded through a catering sack of sausage rolls, deigns to type in Define5. Mode 5 is used for the four-by-four character frames as plotting pixels is about twice as fast as in Mode 2. This is because four pixels are stored in each byte of memory in Mode 5 as opposed to two in Mode 2.

When it's run Define5 presents you with a huge 4 x 4 grid on which to draw your frame. The actual size image will be displayed in the top blue rectangle to the right of the grid.

Key allocations

Arrows	Move cursor
1	Red
2	Yellow
3	Blue
0 or 4	Black (Erase)
L	Load in a saved image
S	Save an image

Incidentally, colour 3 has been altered from default white to blue at line 30 in order to provide a better contrast between the limited number of colours in Mode 5.

Of course you don't have to change the colours but when you mix a lot of yellow with white it can become difficult to see which colour is which.

So, when you're happy with your first design save it. Just press S and wait a second while the computer thinks about it and then type in a name for your first frame next to the word SAVE at the top left of the screen. It's a good idea to use meaningful names for your frames like Frame1 and Frame2. Use the same name with consecutive numbers added to the end.

Now press L and LOAD your frame back in. It will be displayed in the Old Image blue rectangle. This is a good idea because now you can make alterations with your next frame while still having the previous one displayed. Also if you're not happy with a frame just edit the one you've loaded in and save it again. Such power.

That's quite fun to do and has even stopped Rom eating for two minutes while he draws some frames. Naturally impatience has set in and he wants to string his saved images together and animate them. As an example to help you, first design a frame and save it as Frame1. Now make a different design and save it as Frame2.

Type in the Animate program as it is and RUN it. The onscreen curtains will part and the display will alternate between your two designed images. So how does it work and how does one use it?

Firstly you must make the program load each of your frames, just type in the overall name – Frame, for example – and then the number of frames, in the example just two.

You can save all the frames as one file by pressing Escape and typing:

```
*SAVE FILM1 2000 5800
```

Now you can just specify *Film* and *1* when you want to load the film. Use any name you like, of course, it doesn't have to be Film1.

Once all the frames that you are going to use are loaded you need to display them in the order and duration you want. Look at the DATA lines from line 350. All you need to do is type in:

```
DATA 3,6
```

To display Frame 3 six times in a row.

Simple eh? The first number in DATA is the frame you want to display and the second number is how many times you want to display it – which governs the time between each frame. Try altering the DATA at line 350 to:

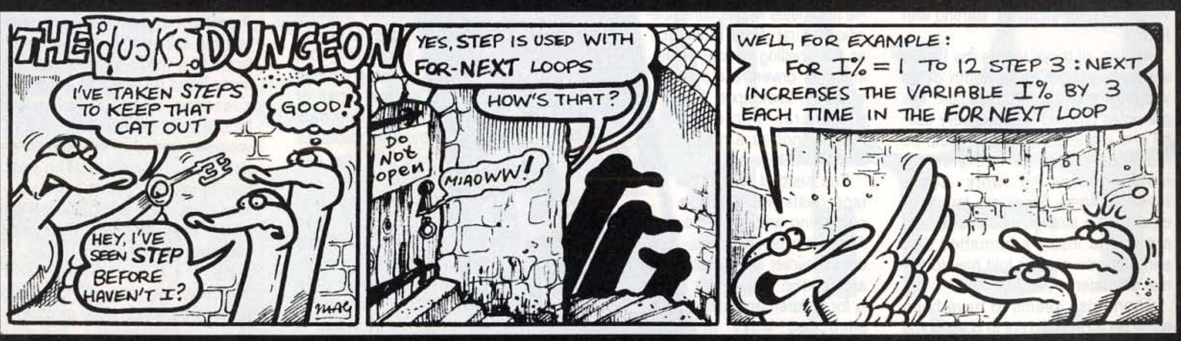
```
DATA1,1,2,1
```

and you'll see that the animation runs very fast. It's up to you which frames you want to show in what order, for how many frames and so on. In order for the computer to know it's run your full animated sequence make sure your last data statement is:

```
DATA-1,-1
```

There's a good example of what can be done with this program on this month's disc – if I can get it past the Board of Censors.

THAT'S THE ONLY TIME I SEE YOU ANIMATED!
LOB
CATERING SACK SAUSAGE ROLLS
MAG


THE ducks DUNGEON
I'VE TAKEN STEPS TO KEEP THAT CAT OUT
GOOD!
HEY, I'VE SEEN STEP BEFORE HAVEN'T I?
MAG
YES, STEP IS USED WITH FOR-NEXT LOOPS
HOW'S THAT?
DO NOT OPEN
MIAOWW!
WELL, FOR EXAMPLE: FOR I% = 1 TO 12 STEP 3 : NEXT INCREASES THE VARIABLE I% BY 3 EACH TIME IN THE FOR NEXT LOOP

Making movies

Mike Goldberg moves in on the film industry

```
   10 REM Animate
   20 REM by Mike Goldberg
   30 REM (c) The Micro User
   40 :
   50 MODE5:H%=&2000:HIMEM=&2000
   60 INPUT"Filename",f$'"Number",N%
   70 FORL%=1TON%:PROCcli("LOAD "+f$+STR
$(L%)+" "+STR$~FNa(L%)):NEXT
   80 :
   90 CLS:PROCC
  100 :
  110 REPEAT READ F%,N%
  120 IFF%=-1RESTORE:READF%,N%
  130 PROCA(F%):PROCw(N%*10)
  140 UNTIL FALSE
  150 :
  160 DEFPROCA(F%)LOCALA%,I%,J%,Y%:Y%=FN
a(F%):A%=&6780:FORJ%=1TO4:FORI%=0TO63STE
P4:A%!I%=Y%!I%:NEXT:A%=A%+&140:Y%=Y%+&40
:NEXT:ENDPROC
  170 :
  180 DEFFNa(F%)=H%+(F%-1)*&100
  190 :
  200 DEFPROCC:VDU23,1,0;0;0;0;19,3,4;0;
  210 GCOL0,131:VDU24,496;496;780;652;
  220 CLG:VDU26:GCOL0,128
  230 VDU24,508;504;770;644;:CLG:VDU26
  240 VDU19,2,1;0;:GCOL3,129
  250 VDU24,456;464;820;684;:CLG:*FX15
  260 G=INKEY(100):A%=632:B%=640:GCOL3,1
  270 FORQ%=1TO20:MOVEA%,464:PLOT1,0,216
  280 MOVEB%,464:PLOT1,0,216:PROCw(5)
  290 A%=A%-8:B%=B%+8:NEXT
  300 VDU19,2,3;0;:ENDPROC
  310 :
  320 DEFPROCw(T%)T%=TIME+T%:REPEATUNTIL
TIME>T%:ENDPROC
  330 DEFPROCcli($&700)LOCALX%,Y%:Y%=7:C
ALL&FFF7:ENDPROC
  340 :
  350 DATA1,6,2,8
  360 DATA-1,-1
```

```
  10 =    0 0      190 = 9719 6
  20 =    0 0      200 = DA36 1
  30 =    0 0      210 = 550B 7
  40 = 9719 9      220 = 53D8 4
  50 = D7AF 5      230 = DDA7 9
  60 = D002 1      240 = 8148 D
  70 = F210 B      250 = 745C 2
  80 = 9719 2      260 = 1193 B
  90 = B97C A      270 = 2C6E B
 100 = 9719 9      280 = 505C 6
 110 = 249A F      290 = B507 8
 120 = DF2D E      300 = 5DA3 1
 130 = 8B9D 1      310 = 9719 2
 140 = 226C B      320 = 3F5D 3
 150 = 9719 C      330 = 659A 4
 160 = 66F8 7      340 = 9719 0
 170 = 9719 7      350 = 1E57 1
 180 = 3480 1      360 = 79AB 3
```

```
   10 REM DEFINES
   20 REM by Mike Goldberg
   30 REM (c) The Micro User
   40 MODE5:VDU19,3,4;0;23,1,0;0;0;0;
   50 PROCgrid:PROCinit
   60 REPEATPROCkeys:UNTIL0:END
   70 :
   80 DEFPROCinit:B$=CHR$224:X%=0
   90 VDU23,224,0,96,96,96,96,96,0;
  100 Y%=768:A%=836:B%=732:C%=2:M%=24
  110
VDU4:COLOUR2:PRINTTAB(14,20)"Old"T
AB(13,21)"Image"
  120 PRINTTAB(0,2)"L= Load SAVEd
image"
  130 PRINTTAB(0,4)"S= SAVE your
design"
  140 VDU5:PROCc:ENDPROC
  150 :
  160 DEFPROCgrid:GCOL0,1
  170 FORI%=0TO768STEP24
  180 IFI%MOD192=0GCOL0,3 ELSE GCOL0,1
  190 MOVE0,I%:PLOT1,768,0:NEXT
  200 FORI%=0TO768STEP24
  210 IFI%MOD192=0GCOL0,3 ELSE GCOL0,1
  220 MOVEI%,0:PLOT1,0,768:NEXT
  230 GCOL0,3:PROCbox(820,748)
  240 PROCbox(820,748-192):ENDPROC
  250 :
  260
DEFPROCbox(A,B)MOVEA,B:PLOT1,280,0
  270 PLOT1,0,-160:PLOT1,-280,0
  280 PLOT1,0,160:ENDPROC
  290 :
  300 DEFPROCkeys
  310 IFINKEY-26PROCmove(-M%,0,-8,0)
  320 IFINKEY-122PROCmove(M%,0,8,0)
  330 IFINKEY-58PROCmove(0,M%,0,4)
  340 IFINKEY-42PROCmove(0,-M%,0,-4)
  350 IFINKEY-82PROCikon("S")
  360 IFINKEY-87PROCikon("L")
  370 IFINKEY-40PROCdraw(0)
  380 IFINKEY-19PROCdraw(0)
  390 IFINKEY-49PROCdraw(1)
  400 IFINKEY-50PROCdraw(2)
  410 IFINKEY-18PROCdraw(3)
  420 ENDPROC
  430 :
  440 DEFPROCmove(x%,y%,a%,b%)
  450 IFX%+x%<0ORX%+x%>744ENDPROC
  460 IFY%+y%<24ORY%+y%>768ENDPROC
  470 PROCc:X%=X%+x%:Y%=Y%+y%
  480 A%=A%+a%:B%=B%+b%:PROCc:ENDPROC
  490 :
  500 DEFPROCdraw(c%)IFF%=1c%=c%+8
  510 PROCc:GCOL0,c%:MOVEX%,Y%:PRINTB$
  520 PLOT69,A%,B%:PROCc:ENDPROC
  530 :
  540 DEFPROCikon(W$):*FX21
  550 COLOUR3:PROCc:IFW$="L"PROCload
  560 screen%=&6410:mem%=&5600
  570 FORJ%=0TO3:FORI%=0TO63
  580 IFW$="L"screen%?I%=mem%?I%
  590 IFW$="L"screen%?(I%+1920)=mem%?I%
  600 IFW$="S"mem%?I%=screen%?I%
  610 NEXT:mem%=mem%+64
  620 screen%=screen%+320:NEXT
  630 IFW$="S"PROCsave
  640 IFW$="L"PROCdrawload
  650 VDU7:PROCc:ENDPROC
  660 :
  670 DEFPROCload:LOCALX%,Y%:VDU4:*FX21
  680 INPUTTAB(0,0)"LOAD "name$
  690 PROCcli("LOAD "+name$+" 5600")
  700 PRINTTAB(0,0)SPC17:COLOUR3
  710 PRINTTAB(0,6)SPC19TAB(0,6)name$
  720 VDU5:ENDPROC
  730 :
  740 DEFPROCdrawload:VDU5:LOCALX%,Y%
  750 X%=0:Y%=768:FORJ%=732TO608STEP-4
  760 FORI%=836TO1084STEP8
  770 K%=POINT(I%,J%):GCOL0,K%
  780 MOVEX%,Y%:PRINTB$:X%=X%+24:NEXT
  790 X%=0:Y%=Y%-24:NEXT:ENDPROC
  800 :
  810 DEFPROCsave:LOCALX%,Y%:VDU4:*FX21
  820 INPUTTAB(0,0)"SAVE "name$
  830 PROCcli("SAVE "+name$+" 5600
5700"
)
  840 PRINTTAB(0,0)SPC17:VDU5:ENDPROC
  850 :
  860
DEFPROCc:GCOL3,C%:MOVEX%,Y%:PRINTB
$:PLOT69,A%,B%:ENDPROC
  870
DEFPROCcli($&700)LOCALX%,Y%:Y%=7:C
ALL&FFF7:ENDPROC
```

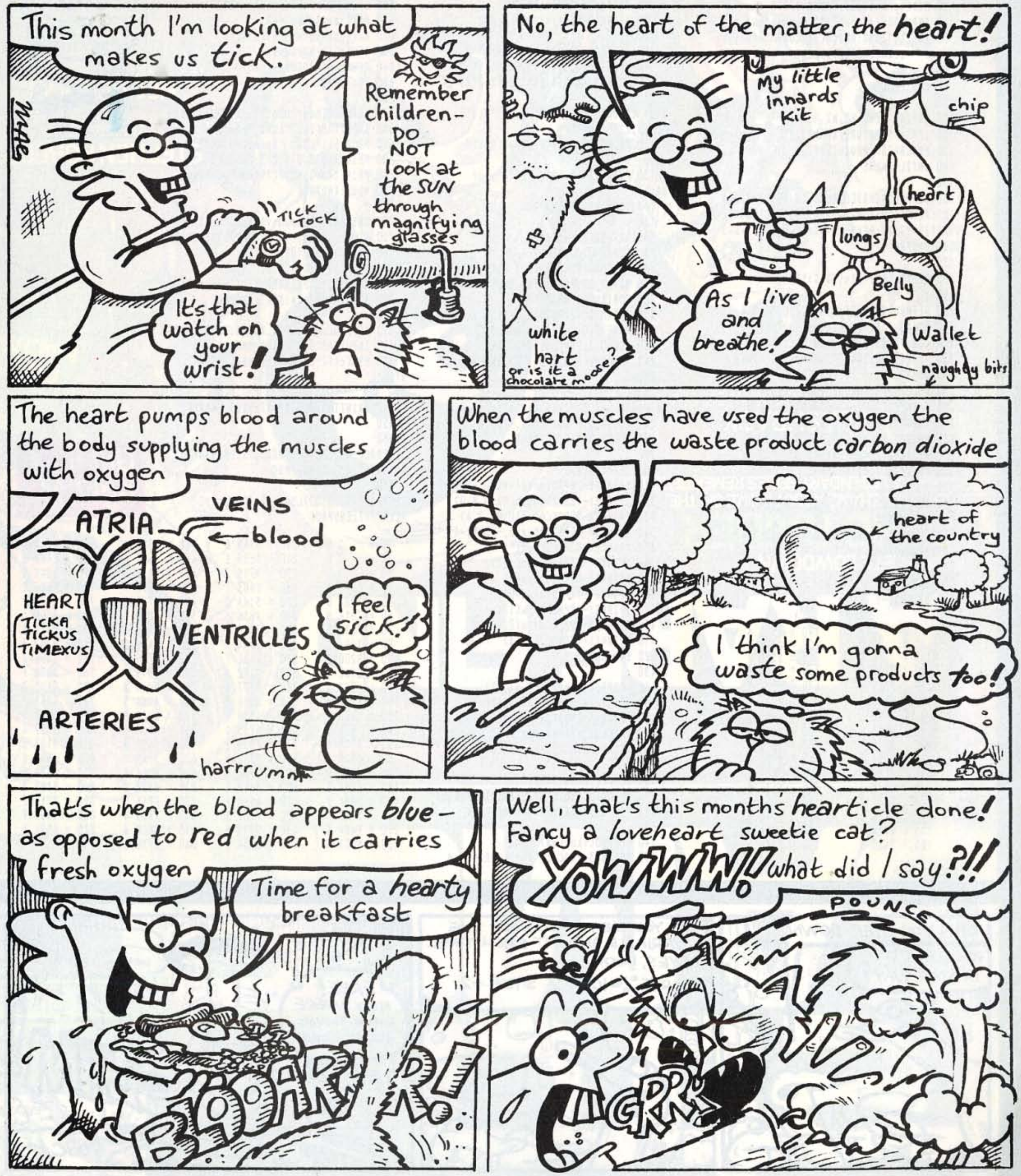
CUT!
ROM PULLANSKI
CREAK!
WHO DOES HE THINK HE IS?

Get it right

```
  10 =    0 0    230 = 6F49 8    450 = 6300 F    670 = A907 5
  20 =    0 0    240 = B659 E    460 =  ED1 0    680 = E46D B
  30 =    0 0    250 = 9719 7    470 = 1ACB 6    690 = 1D4C 3
  40 = C9FE E    260 = E483 7    480 = E5CA F    700 = 96B4 C
  50 = 7982 B    270 = 51AA 0    490 = 9719 5    710 = 39E1 7
  60 = 7D1E D    280 = 4616 6    500 = 7820 F    720 = 7900 C
  70 = 9719 8    290 = 9719 C    510 = B49C E    730 = 9719 E
  80 = 1494 1    300 = 5A41 7    520 = 1A69 0    740 = D202 A
  90 = B200 2    310 = 4C2C F    530 = 9719 9    750 = EA56 F
 100 = B162 D    320 = C192 F    540 = 1519 4    760 = A63D F
 110 =  7CA 2    330 = 7777 4    550 = B0A4 8    770 = BEDE 2
 120 = D114 8    340 = A0AE 0    560 = AA6A 5    780 = 4C5F 7
 130 = CBF8 B    350 = 4169 F    570 = 4CCE 8    790 = A285 1
 140 =  388 3    360 = A735 D    580 = AFCF 9    800 = 9719 4
 150 = 9719 6    370 = F33E E    590 = F199 B    810 = 9102 3
 160 = A8D9 2    380 = F392 D    600 = 3949 D    820 = A611 E
 170 = 5CD2 0    390 =  2D3 0    610 = AD7A F    830 = 232A 5
 180 = F484 8    400 = FA19 7    620 = B532 E    840 = 31B5 3
 190 = 5B3F 2    410 = 4DE2 A    630 = FF1E 5    850 = 9719 7
 200 = 5CD2 7    420 = ED0F E    640 = FF05 4    860 = 338F 7
 210 = F484 3    430 = 9719 6    650 = 88C8 6    870 = 659A 4
 220 = 8F0A A    440 = 603A 6    660 = 9719 C
```

CAN YOU STEP DOWN?
WHY, AM I IN YOUR WAY?
HA!
OH, YOU MEAN DECREASE THE VARIABLE AMOUNT EACH TIME. OH YES, LOOK:
FOR I%=10 TO 2 STEP -2
WHAT THE...?
FREE! NOW WHERE HAVE THOSE DUCKS GONE?
SLAM!
QUACK!

The Safe


This month I'm looking at what makes us *tick*.
Remember children- DO NOT look at the SUN through magnifying glasses
TICK TOCK
It's that watch on your wrist!
No, the heart of the matter, the **heart!**
My little Innards Kit
chip
heart
lungs
Belly
Wallet
naughty bits
white hart
or is it a chocolate moose?
As I live and breathe!
The heart pumps blood around the body supplying the muscles with oxygen
VEINS
ATRIA
←blood
HEART (TICKA TICKUS TIMEXUS)
VENTRICLES
ARTERIES
I feel SICK!
harrrumph
When the muscles have used the oxygen the blood carries the waste product *carbon dioxide*
heart of the country
I think I'm gonna waste some products *too!*
That's when the blood appears *blue* - as opposed to *red* when it carries fresh oxygen
Time for a *hearty* breakfast
BLOOARRRR!
Well, that's this months *hearticle* done! Fancy a *loveheart* sweetie cat?
YOWWW! what did I say?!!
POUNCE
GRR!

Scientist

Have a heart

We're all heart this month as we look at the way blood is pumped around the body. We are using a nice simple diagram which just divides the body into three parts – heart, lungs and muscle.

In this case we're really simplifying it: Muscle really represents everything else in the body so it includes legs and arms, liver and kidney and the head and brain as well.

You'll see that the heart is divided into four parts. The ones at the top are called *Atria* which receive blood along pipes called veins. The pipe from the lungs carries blood which has a fresh supply of oxygen. The muscles has used up the oxygen in the blood which then carries the waste product, carbon dioxide, instead.

The two bottom chambers of the heart are called *Ventricles*. These pump blood away from the heart along pipes called arteries. The stale blood is pumped to the lungs where the carbon dioxide is removed and fresh oxygen is taken on board. The blood with oxygen is pumped off to the muscles – and, of course, the rest of the body.

Blood with oxygen is bright red in colour. The used blood has a more bluish tinge to it so the colours used in the program are about accurate. The program concentrates on one red blood cell and traces its progress around the body as the heart pumps. The process is rather speeded up in the program.

I'm often asked what is meant by the condition *a hole in the heart*? Usually it's a small break in the heart wall which separates the left and right hand sides of the old pump. This allows some used blood to circulate around the body without being cleaned up by the lungs. Many people with a hole in the heart get tired quickly because their muscles do not receive a good supply of oxygen.

There are lots of ways in which a keen programmer could improve my Heart Beat program. Firstly, the graphics could offer more realism perhaps by using colour switching to show the flow throughout the system and perhaps show the size of the heart altering. The sound could also be altered to make the proper double beat effect.

- *I'll be back in circulation next month when we'll make some logical decisions.*

```
   10 REM HEART BEATS
   20 REM The Safe Scientist
   30 REM (c) The Micro User
   40 MODE1
   50 PROCheart
   60 PROClungs
   70 PROCmuscles
   80 PROCpipes
   90 PROCpump
  100 END
  110 DEFPROCheart
  120 MOVE500,400:DRAW530,400:MOVE570,40
0:DRAW630,400:MOVE670,400:DRAW700,400:DR
AW700,600:DRAW670,600:MOVE630,600:DRAW57
0,600:MOVE530,600:DRAW500,600:DRAW500,40
0
  130 MOVE500,500:DRAW540,500:MOVE560,50
0:DRAW640,500:MOVE660,500:DRAW700,500
  140 MOVE600,400:DRAW600,600
  150 MOVE540,500:DRAW560,520:MOVE640,50
0:DRAW660,520
  160 VDU5:MOVE720,520:PRINT;"HEART":VDU
4
  170 ENDPROC
  180 DEFPROClungs
  190 MOVE500,800:DRAW700,800:DRAW700,83
0:MOVE700,870:DRAW700,900:DRAW500,900:DR
AW500,870:MOVE500,830:DRAW500,800
  200 VDU5:MOVE530,940:PRINT;"LUNGS":VDU
4
  210 ENDPROC
  220 DEFPROCmuscles
  230 MOVE500,100:DRAW700,100:DRAW700,13
0:MOVE700,170:DRAW700,200:DRAW500,200:DR
AW500,170:MOVE500,130:DRAW500,100
  240 VDU5:MOVE500,80:PRINT;"MUSCLES":VD
U4
  250 ENDPROC
  260 DEFPROCpipes
  270 MOVE700,830:DRAW750,830:DRAW750,67
0:DRAW630,670:DRAW630,600
  280 MOVE700,870:DRAW790,870:DRAW790,63
0:DRAW670,630:DRAW670,600
  290 MOVE500,170:DRAW450,170:DRAW450,63
0:DRAW530,630:DRAW530,600
  300 MOVE500,130:DRAW410,130:DRAW410,67
0:DRAW570,670:DRAW570,600
  310 MOVE500,830:DRAW350,830:DRAW350,37
0:DRAW530,370:DRAW530,400
  320 MOVE500,870:DRAW310,870:DRAW310,33
0:DRAW570,330:DRAW570,400
  330 MOVE700,170:DRAW750,170:DRAW750,33
0:DRAW630,330:DRAW630,400
  340 MOVE700,130:DRAW790,130:DRAW790,37
0:DRAW670,370:DRAW670,400
  350 GCOL0,0:MOVE 414,330:DRAW446,330:M
OVE414,370:DRAW446,370
  360 DEFPROCpump
  370 COLOUR1:PRINTTAB(25,2)"*=WITH OXYG
EN"
  380 COLOUR2:PRINTTAB(25,4)"*=NO OXYGEN
"
  390 VDU5,19,2,4;0;
  400 REPEAT:RESTORE
  410 FORN=1TO28
  420 READc,x,y
  430 GCOL0,c
  440 MOVEx,y:PRINT"*"
  450 SOUND1,-15,30,1
  460 GCOL0,0:MOVE540,500:DRAW560,500:GC
OL0,3:MOVE540,500:DRAW560,520:TIME=0:REP
EATUNTILTIME>10:GCOL0,0:DRAW540,500:GCOL
0,3:DRAW560,500
  470 SOUND1,-15,20,2
  480 GCOL0,0:MOVE660,500:DRAW640,500:GC
OL0,3:DRAW660,520:TIME=0:REPEATUNTILTIME
>10:GCOL0,0:DRAW640,500:GCOL0,3:DRAW660,
500
  490 TIME=0:REPEATUNTILTIME>60
  500 GCOL0,0
  510 MOVEx,y:PRINT"*"
  520 NEXT
  530 UNTIL0
  540 ENDPROC
  550 DATA1,630,560,1,630,460,1,660,362,
1,756,300,1,756,190,1,660,170,2,540,170
  560 DATA2,416,190,2,416,300,2,416,420,
2,416,530,2,416,640,2,500,666,2,530,560
  570 DATA2,530,460,2,530,362,2,340,362,
2,316,450,2,316,560,2,316,670,2,316,780
  580 DATA2,360,860,2,470,860,2,540,860,
1,670,860
  590 DATA1,752,830,1,752,720,1,670,666
```

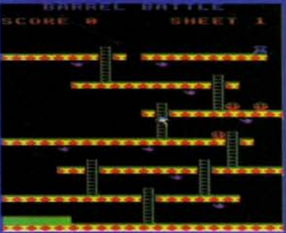
Get it right

```
 10 =    0 0     310 = 94FA 3
 20 =    0 0     320 = 14A8 2
 30 =    0 0     330 = B345 7
 40 = EA3A A     340 = B54A B
 50 = 18E9 3     350 = C460 6
 60 = 2A18 7     360 = E34E 1
 70 = F8DD B     370 = 6A76 D
 80 = CFFC 8     380 = 28E9 A
 90 =  9B9 E     390 = E843 0
100 = FD2E A     400 = 7D04 A
110 = B38D A     410 = DEE9 E
120 = 57CA B     420 =  DB2 5
130 = 3632 1     430 = 7998 3
140 = 6B3A E     440 = CBA0 7
150 = EF40 8     450 = 2DAC 8
160 = 7A3C 2     460 = 73C3 7
170 = ED0F 4     470 = 6B7B A
180 = 817C 0     480 = B150 4
190 = CE11 C     490 = 10AD C
200 = 9D9A D     500 = 130E E
210 = ED0F 4     510 = CBA0 C
220 = 157B D     520 = 2C83 B
230 = B0C0 7     530 = 53CE 9
240 = 2B7A F     540 = ED0F E
250 = ED0F 3     550 = 12F6 2
260 = 6498 F     560 = D72B 5
270 = F58A 5     570 = DBD4 B
280 = F385 E     580 = 5C44 D
290 = FE80 7     590 = DC45 2
300 = 7ED2 D
```

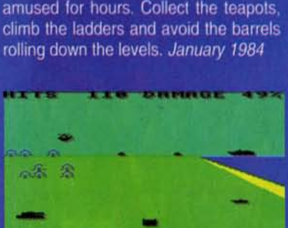
Collect the games that made history

This is what your disc will contain

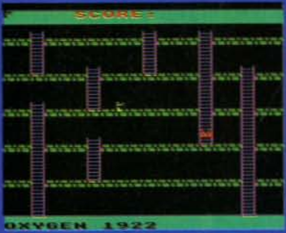
Air Strike Test your skill over three levels of surface-skimming flying, taking out air bases and destroying aliens. Fast, furious and a little tricky. *May 1983*



Barrel Battle A fun game to keep you amused for hours. Collect the teapots, climb the ladders and avoid the barrels rolling down the levels. *January 1984*

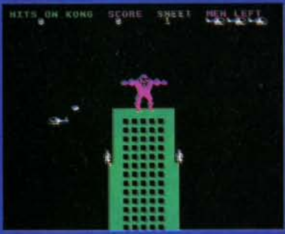


Death Watch A game for the paranoid. Attacked from land, sea and air you must defend your position by efficient use of the cannon. *March 1983*



Fruitie The fruit patch is filled with nasties which follow you through levels and up ladders. Your only defence is how fast you can dig. *August 1983,*

Goblins Armed with five magic coins you must find your way around a maze of trees, avoiding and destroying the deadly goblins. *November 1983*



King Kong The classic villain has kidnapped two girls and once again sits astride the Empire State Building. Can you avoid the falling boulders and rescue the girls? *April 1983*

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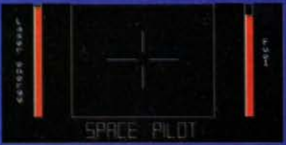
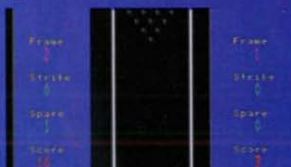
Robin Hood Meet the Sheriff in this version of the classic love story. Firing arrows at the baddies creates a ladder to rescue Marion. *September 1983*

Space Pod A new threat from outer space. These creatures will eat your base unless killed with the lasers. A simple and finger-aching version of Space Invaders. *July 1983*



Space Pilot A sophisticated and polished space game. Sharp shooting, docking and landing on planets all need a keen eye and precise positioning. *June 1983*



Ten Pin Go down the alley but keep out of the gulley in this computer version of 10-pin bowling. But it's not quite as simple as it seems. *July 1983*

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All my own work

Steve Turnbull describes how to produce your own personalised clothing

BACK in the mid-70s if you wanted to make a individual statement you'd tie-and-dye a tee shirt or trousers or whatever took your fancy. It wasn't exciting but it was all yours.

More recently you could find a shop that let you spell out your own words on a sweatshirt and the individual letters would be heat-bonded on to the shirt.

In February's News feature we mentioned a company called Awards Plus who, for less than a tenner, can print a design on a single tee- or sweatshirt from a set of postscript files. Many people have written asking exactly how to do it, so here are all the details you'll need.

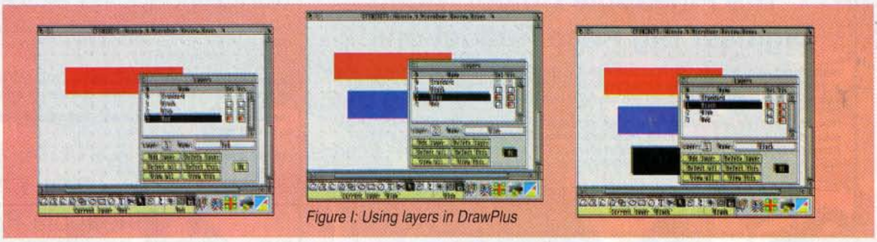


Figure I: Using layers in DrawPlus

What to do

The first step is to produce the original artwork – Draw, DrawPlus and Poster are ideal. Bold, solid colours are best because cloth stretches, so work requiring subtle shading using two colours is more likely to go wrong.

If you're not an artist there's plenty of clip art – both PD and commercial – you can use. By ungrouping the clip art you'll be able to alter the individual colour areas if necessary. Text must be converted to paths, and both DrawPlus and Poster have facilities for this built in.

You'll also need to re-size it to cover the chest (or back) area. Don't try to fill the whole front if the edges are important.

Colour handling is the tricky bit but is made a lot easier if you use DrawPlus and its layers. You will have to create a separate Postscript file for every colour, so use a different layer of DrawPlus for each one.

The colours allowed are black, red, blue, green and yellow. But when it's printed out you have to change the colour being processed to black. This probably seems strange but let's take an actual example.

Figure I shows the original DrawPlus file being constructed with a separate colour on each layer. You can see that the layers dialogue box can be used to hide different layers and prevent objects on specific layers from being selected.

Figure II illustrates printing the red layer. The objects have been placed so that they don't overlap, otherwise the colours will mix when the design is printed which will not produce the desired effect. The red has been converted to black.

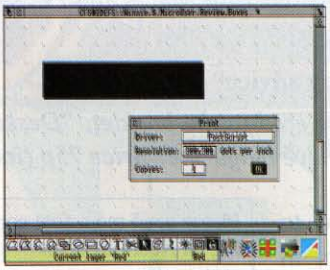
If you want colours to touch you'll need make them line up perfectly or use white objects to blot out certain areas, Figure III. You can use the Library to copy objects between layers and to create the white blots, Figure IV.

If you are using a drawing package that doesn't have layers – Draw, Poster and so on – you'll have to save the main drawing then delete all the parts that aren't the colour you want to print. That colour should then be converted to black and printed. The original drawing should be reloaded and the next colour chosen.

An important consideration is the postscript printer driver itself. This must be set up to print to a file – you specify the file name from the iconbar menu, or drag the save icon if you're using an A5000.

Choose a different file name for each colour – the name of the colour is best.

Finally put the files on to a PC disc using Minerva's PC-Access, Arxe's MultiFS or one of the PD applications available, and send it to Awards Plus.


CFS#IDEFS::Minnie.$.MicroUser.Review.Boxes

Print

Driver: PostScript

Resolution: 300x300 dots per inch

Copies: 1

Current layer "Red"

Red

Figure II: Printing the red layer. All the objects bust be made black first

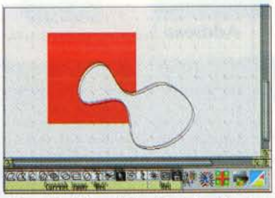
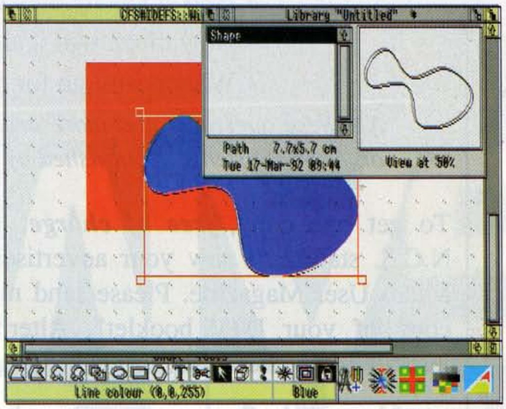


Figure III: Using white objects (outlined in black) to create touching colours


CFS#IDEFS::Mi

Library "Untitled"

Shape

Path 7.7x5.7 cm

Tue 17-Mar-92 09:44

View at 50%

Line colour (0,0,255)

Blue

Figure IV: Blue layer with the curved object

Clubs and societies

Although this service provides an easy way to produce individualised clothing it's even better for groups, clubs, societies or even businesses to create their own identifiable shirts.

Awards Plus can be found at Old Forge, Single Hill, Shoscombe, nr Bath BA2 8LZ on 0761 437043.

A one-off Tee-Shirt costs £8.95 to produce.

PINEAPPLE SOFTWARE

The Pineapple Colour Video Digitiser Big Price Reductions!!!

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The unit can be switched between a standard PAL input on a BNC connector or an S-VHS input. The S-VHS facility allows a computer monitor to be used as a high quality S-VHS display unit.

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OOPS! object-oriented spiders

In the final part of his series Steve Turnbull looks at different aspects of his Arachnoids program

THE first word in the headline may look a little strange but it's an abbreviation of one of those infamous computer jargon phrases: Object Oriented Programming.

When computers were in their infancy programming was generally done in straight lines, each action required was carried out in sequence. Languages created around this time – Fortran, Cobol and the original Dartmouth College Basic – still conform to the straight line approach.

Eventually more sophisticated techniques were required, particularly for simulations, and new languages were invented to cope with these needs. Here the program is not necessarily carried out in sequence, but objects are created and these carry out their programmed actions apparently simultaneously.

For example a simulation of a traffic junction could be put together – vehicles and traffic lights would be the objects in it. The main controlling program would create vehicles with specific destinations at a particular rate, they would approach the simulated junction and stop if the traffic light objects are in their red state.

However each type of object is completely separate from every other and their behaviour is fixed by the individual routines attached to them.

The final step in the sequence was the creation of object-oriented languages. Here an attempt is made to mimic reality much more closely where objects can belong to a particular class (type) and sub-classes can be defined which inherit the behaviour of the parent class but can have additional or modified forms of behaviour themselves. You can have sub-sub-classes and so on indefinitely.

An example here could be a class called *roadVehicle*, this might have an attribute called *fourWheels* and behaviour called *movement* and this would be defined as the wheels rotating.

A sub-class could be *haulage Vehicle* which would not have any movement behaviour defined, but its wheels attribute might be *sixWheels*. A sub-class of *trackedVehicle* might introduce many different features and behaviours.

If a haulageVehicle is created and instructed to move, it uses the movement behaviour inherited from its parent class, roadVehicle. This means that if a refinement is made to the movement behaviour in roadVehicle, every sub-class (haulageVehicle, passengerVehicle and so on) would change its behaviour appropriately.

New behaviours and attributes can be added or removed at any level and will affect all the sub-classes derived from that level.

Simulation

So what does this have to do with the game? Strictly speaking Arachnoids is a simulation rather than object-oriented. A list is maintained of each object and the time when it is to be next executed. The list is scanned continuously until the current time passes the time of execution for one of the objects.

At this point the type of the object is checked and a particular routine selected to control its actions. The time of execution is updated by adding a fixed amount to it. If two objects are set to execute simultaneously the first in the list is performed before the other.

Each type of object – player, monster, generator, fungus and so on – has its own distinct routine to control its behaviour. But the player and the monsters share a routine to decide what happens when a move takes place.

The player's direction of movement is controlled by the keys pressed, which gives a +1, 0 or -1 change left-right and a +1, 0 or -1 change up-down. For the monster the choice of direction is controlled by the direction of the player. It will always try to move towards the player but will never move diagonally. The exact choice of up-down or left-right is made at random.

The direction selected is then fed into the same movement routine, so walls provide a solid barrier, spaces can be moved into, teleports will change the position of the player or monster, power pills will supply energy to either player or monster and so on.

So in this sense both players and monsters belong to a class of *moving things*, their behaviour when it comes to choosing the direction is different but that as a result of the movement is pretty much the same.

Their attributes are similar but the player possesses an extra attribute in the form of a fire-rate which controls the frequency with which bullets can be fired.

Monsters have a different behaviour to players when they are killed in that they turn into fungus. The fungus and generators both belong to a *breeding* class but differ in what they produce and the frequency it happens.

So you see the complicated principles of modern computing can be applied even on the Electron, though perhaps a little slowly.

➤

Go faster stripes

As promised here's a revised version of the Arachnoids program just for the 8-bit machines. In fact very little has been changed, the important thing when converting Basic to machine code is to isolate those parts of the program that take a long time to execute and change those first.

It's quite normal to produce a hybrid Basic/machine code program that runs at an acceptable speed. The ease with which machine code can be interfaced with Basic on the Acorn machines makes this an even more likely result.

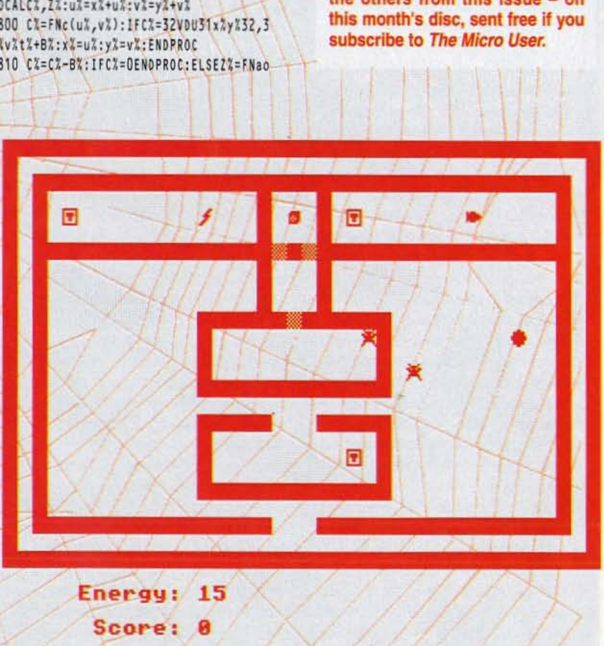
In Arachnoids the worst culprit was the code that scanned the objects looking for the next one to execute. Simply converting this makes a major difference to the overall execution speed.

The only other routine modified was the one to read the character off the screen. Although the Basic version executes quickly it is called frequently so any speed increase is a benefit.

```
   10 REM > Arachno
   20 REM by Steve Turnbull
   30 REM (c) The Micro User
   40 MODE4:PROCi:PROCa:ONERRORPROCer
   50 REPEATPROCht(KT%):REPEATPROCig
   60 REPEAT?n%=N%:A%=I%:I%=USRnz%AND&FF
   70 PROCdo(I%):UNTIL(G%=0)OR(M%!E%<=0)
   80 PROCw(100):UNTILG%>0
   90 PROCrd:UNTILFALSE
  100 DEFPROCi:VDU23,1,0;0;0;0;:*FX4,1
  110 Z%=RND(-TIME):hs%=10
  120 DIMhs%(hs%),hs$(hs%):KT%=TRUE
  130 FORH%=1TOhs%:hs%(H%)=H%*10
  140 hs$(H%)="The Micro User":NEXT
  150 lx%=0:wx%=39:ty%=0:hy%=24:my%=31
  160 X%=lx%+1:Y%=ty%+1:oX%=-1:oY%=-1
  170 ww%=wx%:hw%=my%:op%=1:oe%=2:ow%=3
  180 ot%=4:og%=5:om%=6:of%=7:ob%=8:or%=
9:B%=128
  190 VDU&8017;-1;-1;-1;-1;&8117;&7E18;&
FF7E;&7EFF;&187E;
  200 VDU&8217;&0603;&1E0C;&180C;&6030;&
8317;&B800;&FFFE;&B8FE;0;
  210 VDU&8417;&81FF;&BDBD;&9999;&FF81;&
8517;&3E00;&6E7E;&6E56;&7C;
  220 VDU&8617;&3C42;&7EDB;&7E3C;&8142;&
8717;&320C;&566C;&5C3A;&3068;
  230 VDU&8817;&55AA;&55AA;&55AA;&55AA;&
8917;0;&1800;&18;0;
  240 mo%=30:T%=0:X%=4:Y%=8:E%=16:J%=20:
D%=24:S%=28:H%=ASC".":DIMO%mo%*(S%+4)
  250 nx%=126-H%:mu%=-88:md%=-104:ml%=-9
8:mr%=-67:IFPAGE<&8000md%=-105:mu%=-73
  260 fr%=-74:nL%=1:ENDPROC
  270 DEFPROCer:IFERR=17IFNOTINKEY-1KT%=
TRUE:ENDPROC
  280 ONERROROFF:VDU23,1,1;0;0;0;26,12:*
FX15
  290 REPORT:PRINT" at ";ERL:END
  300 DEFPROCcls(X%,Y%,U%,V%,C%)VDU28X%Y
%+V%X%+U%Y%:ww%=U%:hw%=V%
  310 IFC%>-1VDU17C%+128,17,1-C%,12:ELSE
VDU26,17,128,17,1:ww%=wx%:hw%=my%
  320 ENDPROC
  330 DEFPROCht(T%)REPEATIFT%PROCin:ELSE
PROChs
  340 PROCcn("Press SPACE to play",30)
  350 T%=NOTT%:K%=FNkp(" ",500):UNTILK%:
L%=0:sc%=0:cs%=5:fs%=10:ff%=0:ENDPROC
  360 DEFFNkp(k$,T%)LOCALK%:T%=T%+TIME:R
EPEATK%=INSTR(CHR$255+k$,INKEY$0)-1:UNTI
LK%ORTIME>T%:=K%
  370 DEFPROCin:PROCh("Instructions",0):
PROCcn("Destroy all generators on each l
evel",5)
  380 PROCci(128,"Wall"):PROCci(129,"You
"):PROCci(130,"Energy")
  390 PROCci(131,"Weapon"):PROCci(132,"T
eleport"):PROCci(133,"Generator")
  400 PROCci(134,"Monster"):PROCci(135,"
Fungus"):PROCci(136,"Barrier"):ENDPROC
  410 DEFPROCci(C%,s$)PROCcn(CHR$C%+STRI
NG$(20-LENs$,".")+s$,9+(C%-128)):ENDPROC
  420 DEFPROChs:LOCALQ%,R%:PROCh("High s
cores",0):FORQ%=1TOhs%:R%=20-LENhs$(Q%)
  430 PRINTTAB(5,7+hs%-Q%)hs$(Q%)STRING$
(R%,".")FNz(hs%(Q%)):NEXT:ENDPROC
  440 DEFFNz(N%)=RIGHT$("......."+STR$N%
,8)
  450 DEFPROCh(k$,Y%)VDU26:CLS:PROCcn(k$
,Y%):ENDPROC
  460 DEFPROCig:VDU26,12:I%=0:L%=L%+1:IF
(L%-1)MODnL%=0RESTORE:READnL%
  470 PROCh("Level "+STR$L%,13):PROCw(50
):PROCcn("Get Ready...",16):PROCw(200)
  480 PROCdl(L%):PRINTTAB(5,26)"Energy:"
TAB(6,28)"Score:";:ENDPROC
  490 DEFPROCw(T%)T%=T%+TIME:REPEATUNTIL
TIME>T%:ENDPROC
  500 DEFPROCdl(L%):PROCcls(lx%,ty%,wx%,
hy%,1)
  510 PROCcls(lx%+1,ty%+1,wx%-2,hy%-2,0)
:PROCds(L%):ENDPROC
  520 DEFPROCds(L%)LOCALF%,Q%,o$:VDU26:R
EADF%,o$:K%=B%:FORQ%=1TOF%-1:PROCdd:NEXT
:PROCdob(o$):ENDPROC
  530 DEFPROCdd:LOCALP%,s$:READs$:FORP%=
1TOLENs$
  540 PRINTSTRING$(ASCMID$(s$,P%)-H%,CHR
$K%);:K%=ABS(K%-B%-32):NEXT:ENDPROC
  550 DEFPROCdob(s$)LOCALP%:N%=0:G%=0:RE
PEATPROCno(FNv,FNv,FNv,FNv,TIME,FNv,FNv)
:UNTILP%>=LENs$:ENDPROC
  560 DEFFNv:P%=P%+1:LOCALc$:c$=MID$(s$,
P%,1):IFc$<>"!"=ASCc$-H%
  570 P%=P%+2:=nx%*(ASCMID$(s$,P%-1)-H%)
+ASCMID$(s$,P%)-H%
  580 DEFPROCno(t%,x%,y%,e%,j%,d%,s%)IFN
%=mo%ENDPROC:ELSEIFt%=og%G%=G%+1ELSEIFt%
=op%M%=FNao(N%)
  590 PROCso(N%):PROCpo(N%):N%=N%+1:ENDP
ROC
  600 DEFPROCko(I%)PROCgo(N%-1):PROCso(I
%):N%=N%-1:ENDPROC
  610 DEFPROCgo(N%)LOCALZ%:Z%=FNao(N%):t
%=Z%!T%:x%=Z%!X%:y%=Z%!Y%:e%=Z%!E%:j%=Z%
!J%:d%=Z%!D%:s%=Z%!S%:ENDPROC
  620 DEFPROCso(N%)LOCALZ%:Z%=FNao(N%):Z
%!T%=t%:Z%!X%=x%:Z%!Y%=y%:Z%!E%=e%:Z%!J%
=j%:Z%!D%=d%:Z%!S%=s%:ENDPROC
  630 DEFPROCpo(N%)LOCALZ%:Z%=FNao(N%):V
DU31Z%!X%Z%!Y%Z%!T%+B%:ENDPROC
  640 DEFFNao(A%)CALLao%:=!ac%AND&FFFF
  650 DEFFNj(N%)=J%+FNao(N%)
  660 DEFPROCdo(I%)PROCgo(I%):PROCe:IFt%
=0ENDPROC:ELSEj%=TIME+ABSs%*cs%
  670 IFt%=op%PROCop(INKEYml%-INKEYmr%,I
NKEYmu%-INKEYmd%,INKEYfr%)ELSEIFt%=og%PR
OCog:ELSEIFt%=om%PROCom(SGN(U%-x%),SGN(V
%-y%)):ELSEIFt%=of%PROCof:ELSEIFt%=or%PR
OCor
  680 PROCso(I%):ENDPROC
  690 DEFPROCe:IFe%>0ENDPROC
  700 VDU31x%y%32:IFt%=om%PROCnf(x%,y%,5
,30)ELSEIFt%=og%G%=G%-1
  710 t%=0:PROCko(I%):ENDPROC
  720 DEFPROCop(u%,v%,F%)PROCdt:IFff%ff%
=ff%-1ELSE*FX21
  730 IFF%PROCf:ELSEPROChop
  740 U%=x%:V%=y%:ENDPROC
  750 DEFPROCdt:PRINTTAB(13,26);e%SPC2TA
B(13,28);sc%;:ENDPROC
  760 DEFPROCf:IFu%=0IFv%=0ENDPROC:ELSEI
Fff%ENDPROC
  770 LOCALC%:C%=FNc(x%+u%,y%+v%):IFC%=3
2PROCno(or%,x%+u%,y%+v%,e%,TIME,(u%*&100
00)+(v%AND&FFFF),1)ELSEPROChor(C%,x%+u%,
y%+v%)
  780 ff%=fs%:e%=e%-1:ENDPROC
  790 DEFPROChop:IFu%=0IFv%=0ENDPROC:ELS
ELOCALC%,Z%:u%=x%+u%:v%=y%+v%
  800 C%=FNc(u%,v%):IFC%=32VDU31x%y%32,3
1u%v%t%+B%:x%=u%:y%=v%:ENDPROC
  810 C%=C%-B%:IFC%=0ENDPROC:ELSEZ%=FNao
(FNf(C%,u%,v%))
  820 IFC%=ot%PROCtp(Z%,u%,v%):ENDPROC
  830 IFC%=oe%PROCze(-Z%!E%):PROCzk(Z%):
ENDPROC
  840 IFC%=of%PROCze(Z%!E%):PROCde(Z%,1)
:ENDPROC
  850 IFC%=ow%PROCwp:ENDPROC:ELSEIFC%=ob
%PROCde(Z%,1):PROCze(2):ENDPROC
  860 IFC%<>t%IFC%=om%ORC%=op%PROCde(Z%,
2):PROCze(1)
  870 ENDPROC
  880 DEFFNf(C%,x%,y%)LOCALL%,K%:K%=-1
  890 FORL%=0TON%-1:Z%=FNao(L%):IFZ%!T%=
C%IFZ%!X%=x%IFZ%!Y%=y%K%=L%:L%=N%
  900 NEXT:=K%
  910 DEFPROCde(I%,V%)V%=I%!E%-V%:IFV%<0
V%=0
  920 I%!E%=V%:IFI%!T%=om%I%!J%=I%!J%+I%
!S%ELSEI%!J%=TIME
  930 ENDPROC
  940 DEFPROCze(Z%)e%=e%-Z%:ENDPROC
  950 DEFPROCzk(Z%)Z%!E%=0:Z%!J%=TIME:EN
DPROC
  960 DEFPROCwp:PROCzk(Z%):IFt%=op%IFfs%
>2fs%=fs%-1:ELSEIFt%=om%IFs%>1s%=s%-1
  970 ENDPROC
  980 DEFPROCtp(Z%,P%,Q%)LOCALu%,v%:u%=Z
%!D%DIV64:v%=Z%!D%MOD64
  990 VDU31x%y%32,31u%v%t%+B%:x%=u%:y%=v
%:Z%!E%=Z%!E%-1:ENDPROC
```

TAKE IT EASY

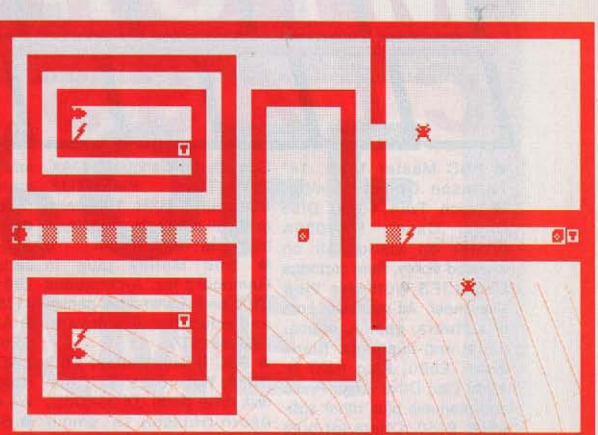
If you would like to save the wear and tear on your fingers you'll find this listing – together with all the others from this issue – on this month's disc, sent free if you subscribe to *The Micro User*.



Energy: 15

Score: 0

```
 1000 DEFPROCog:IFd%IFRND(300)=1IFFNr(x%
,y%)=32PROCnm(x%+u%,y%+v%,e%/2,s%+RND(3)
):d%=d%-1:IFd%<1d%=0
 1010 ENDPROC
 1020 DEFPROCnm(x%,y%,e%,s%)PROCno(om%,x
%,y%,e%,TIME+s%*2,0,s%):ENDPROC
 1030 DEFPROCom(u%,v%)IFABSu%EORABSv%ELS
EIFRND(2)=1u%=0ELSEv%=0
 1040 PROChop:ENDPROC
 1050 DEFPROCof:IFRND(50)=1IFFNr(x%,y%)=
32PROCnf(x%+u%,y%+v%,e%-1,s%+RND(3)-1)
 1060 ENDPROC
 1070 DEFFNr(x%,y%)LOCALK%:u%=0:v%=0:K%=
RND(4):IFK%=1u%=1:v%=0ELSEIFK%=2u%=-1:v%
=0ELSEIFK%=3u%=0:v%=1ELSEIFK%=4u%=0:v%=-
1
 1080 =FNc(x%+u%,y%+v%)
 1090 DEFPROCnf(x%,y%,e%,s%)PROCno(of%,x
%,y%,e%,TIME+s%*2,0,s%):ENDPROC
 1100 DEFPROCor:LOCALu%,v%:v%=d%AND&FFFF
:u%=d%DIV&10000:IFv%>1v%=-1
 1110 C%=FNc(x%+u%,y%+v%):VDU31x%y%32:IF
C%=32u%=x%+u%:v%=y%+v%:VDU31u%v%t%+B%:x%
=u%:y%=v%ELSEPROChor(C%,x%+u%,y%+v%):t%=
0
 1120 ENDPROC
 1130 DEFPROChor(C%,x%,y%)C%=C%-B%:IFC%=
0ENDPROC
 1140 LOCALK%:K%=FNf(C%,x%,y%):IFK%>-1PR
OCde(FNao(K%),e%):sc%=sc%+5
 1150 ENDPROC
 1160 DEFFNc(X%,Y%)=USRch%AND&FF
 1170 DEFPROCm(k$)PROCcls(lx%,my%,wx%,0,
0):PROCcn(k$,0):ENDPROC
 1180 DEFPROCcn(k$,Y%)PRINTTAB((ww%-LENk
$)/2,Y%)k$;:ENDPROC
 1190 DEFFNm(t$,m$)LOCALo$,M%,X%:m$=m$+d
$:PROCt(t$):X%=(ww%-LENt$)/2:REPEAT
 1200 o$=o$+CHR$ASCm$:P%=INSTR(m$,d$):PR
INTTAB(X%,M%)LEFT$(m$,P%-1);
 1210 m$=MID$(m$,P%+1):M%=M%+1:UNTILm$="
":=o$
 1220 DEFPROCt(t$)PROCm(""):PROCcls(lx%,
my%-6,wx%/3,0,0):PROCcn(t$,0):PROCcls(lx
%,my%-5,wx%/3,5,1):ENDPROC
 1230 DEFPROCrd:sc%=sc%+M%!E%:VDU26,12:P
ROCcn("Game Over",7):PROCw(200):*FX15
 1240 KT%=FALSE:IFsc%<hs%(1)PROCw(200):E
NDPROC:ELSELOCALA%,B%
 1250 CLS:PROCcn("Well done!",8):PROCcn(
"You've made a new high score",10)
 1260 PROCcn("Enter your name",12):INPUT
TAB(15,14)"..........."TAB(15,14)n$
 1270 A%=2:REPEATB%=A%-1:IFsc%>hs%(A%)hs
%(B%)=hs%(A%):hs$(B%)=hs$(A%)
 1280 A%=A%+1:UNTILsc%<hs%(A%)ORA%=hs%:h
s%(A%)=sc%:hs$(A%)=LEFT$(n$,10):ENDPROC
 1290 DEFPROCa:bs%=2048:DIMb%bs%:wrch=&F
FEE:byte=&FFF4:word=&FFF1:jX%=4:jY%=8
 1300 P%=&60:[OPT2:.ac%OPT FNd(0):.tm%OP
T FNn(5):.pt%OPT FNw(0):.pt2%OPT FNw(0)
 1310 .W%OPT FNn(S%+4):]:IFP%>&8F:X
 1320 FORL%=0TO3STEP3:P%=b%:[OPTL%
 1330 .ch%JSRtb%:LDA#135:JSRbyte:TXA:RTS
 1340 .tb%PHA:LDA#31:JSRwrch:TXA:JSRwrch
:TYA:JSRwrch:PLA:RTS
 1350 .ao%PHA:OPT FNld(ac%,0%):PLA:TAX:I
NX:LDY#S%+4:.ao1%DEX:BEQao2%
 1360 CLC:TYA:ADCac%:STAac%:LDA#0:ADCac%
+1:STAac%+1:JMPao1%:.ao2%RTS
 1370 .st%PHA:OPT FNldxy(tm%):LDA#3:JSRw
ord:PLA:RTS
 1380 .np%CLC:TXA:ADCac%:STApt2%:LDA#0:A
DCac%+1:STApt2%+1:RTS
 1390 .nz%TAX:INX:TXA:CMPn%:BNEnz1%:LDA#
0:.nz1%STAlo%
 1400 JSRao%:LDX#J%:JSRnp%:JSRst%:LDY#3
 1410 LDA(pt2%),Y:CMPtm%,Y:BEQnza%:BCCnz
2%:.nza%DEY
 1420 LDA(pt2%),Y:CMPtm%,Y:BEQnzb%:BCCnz
2%:.nzb%DEY
 1430 LDA(pt2%),Y:CMPtm%,Y:BEQnzc%:BCCnz
2%:.nzc%DEY
 1440 LDA(pt2%),Y:CMPtm%,Y:BEQnz2%:BCCnz
2%
 1450 LDAlo%:JMPnz%:.nz2%LDAlo%:RTS
 1460 .M%OPT FNd(0):.n%OPT FNb(0)
 1470 .lo%OPT FNd(0)
 1480 \
 1490 ]:IFP%>b%+bs%X
 1500 NEXT:ENDPROC
 1510 DEFFNd(D%)!P%=D%:P%=P%+4:=L%
 1520 DEFFNw(W%)!P%=W%:P%=P%+2:=L%
 1530 DEFFNb(B%)?P%=B%:P%=P%+1:=L%
 1540 DEFFNn(N%)P%=P%+N%:=L%
 1550 DEFFNld(A%,V%)[OPTL%:LDA#V%MOD256:
STAA%:LDA#V%DIV256:STAA%+1:]:=L%
 1560 DEFFNldxy(V%)[OPTL%:LDX#V%MOD256:L
DY#V%DIV256:]:=L%
 1570 ==================================
 1580 DATA4
 1590 DATA2
 1600 DATA4A@8.36A8V.B6B4V.B6@4V.B3A2`0B
1M28.80;2B.B2E@8!J282E28!:282228!@Z8/AD=
.04=:8.5
 1610 DATAWT0/R/0//</1/=//0//</1/=//0//<
/1/=//0/>///?/0//</1/=//0//</1/=//0//</1
/=//0//84/49//0//8/9/9//0//8/9/9//0//8/9
/9//0//8;9//0//P//0//83139//0//8/9/9//0/
/8/9/9//0//8/9/9//0//8;9//0//P//0/>1?/0T
W
 1620 DATA3
 1630 DATA3S:`0/4048.540@8.5//::.061:8.>
63:8.?65:8.@67:8.A69:8.B0I:`.B3B:`.V2T:8
!>480348.B1338.813A8.803@8.B2:?0!>082:50
!>D86;:8.B6H:3.B
 1640 DATAWF/;0/<7/;0//:/7/;0///8///5//;
0////6/////3///;0////6/////3/=0///6/////
/3///;0//8/////3///;0/:////3///;0<///3//
/;?//3//>>/3/=?//3//><///3///;0/:////3//
/;0//8/////3///;0///6/////3///;0////6//
///3/=0////
 1650 DATA6/////3///;0///8///5//;0//:/7/
;0/<7/;0F/;W
 1660 DATA3
 1670 DATA/A:5./4;48.34;@8.34G@8.34G48.3
6A3/.B6AA/.B6H:/.B6::/.B67:/.B6K:/.B3N:/
BV34:/BV
 1680 DATAWT0T0T0T095/5:09/;/:09/151/:00
50/;/05100/3/0////1/1////0/3/100/3/0////
/3/////0/3/100/3/0/////3/////0/3/100/8/7
/8/100/3/0/////3/////0/3/100/3/0/////3//
///0/3/100/3/0////1/1////0/3/10050/;/051
09/151/:09/
 1690 DATA;/:095/5:0T0T0T0TW
 1700 DATA2
 1710 DATA//9/./6L9V.B6K9V.B6J9V.B6I9V.B
6H9V.B1C38.81B38.805?`.B06?`.B6G9V.B6F9V
.B3S7`B/3S;`B/
 1720 DATAWT0/E<0//C/<0///A//<0////?///<
0/////?//<0////A/84///C8/10//N/10/P10T0/
P10//N/10///C8/10////A/84/////?//<0/////
/=///<0/////=////<0////?///<0///A//<0//C
/<0/E<0TW
```



Get it right

```
  10 =    0 0
  20 =    0 0
  30 =    0 0
  40 = C832 2
  50 = 72D5 5
  60 = C8CF E
  70 = E89C 5
  80 = 1AB3 D
  90 = 32AA 8
 100 = E2E1 1
 110 =  89B 9
 120 = 6628 B
 130 = ECCE A
 140 = 947C 3
 150 =  19E 8
 160 = 4A6C 0
 170 = 8F91 B
 180 = DEC7 E
 190 = B3F1 4
 200 = E8EA D
 210 = 795C 6
 220 = 126B 8
 230 = DFB6 D
 240 =  107 A
 250 = C58E 3
 260 = 6293 3
 270 = 4A6F 5
 280 = A0DA E
 290 =  532 D
 300 = A4CE 5
 310 = 2D01 1
 320 = ED0F 0
 330 = C3F9 7
 340 = F19E 5
 350 = AFE1 2
 360 = 7EAE 0
 370 = B5EA 5
 380 = ACAF 6
 390 = 7184 C
 400 = F240 5
 410 = C527 1
 420 = 1207 4
 430 =  CF8 C
 440 = 7222 1
 450 = 259D 3
 460 = B3E4 E
 470 = 3B41 F
 480 = 7364 B
 490 = 544E 5
 500 = 364B F
 510 = 9C88 A
 520 = A372 0
 530 = 9E28 D
 540 = 49D3 E
 550 = DDCA 0
 560 = BED9 3
 570 = 4CDF 7
 580 = 95F4 C
 590 = 370B E
 600 = DA66 7
 610 = DC11 E
 620 = 52E8 F
 630 =  691 C
 640 = AE1F 1
 650 = B42B 6
 660 = DBA3 4
 670 = 64ED 3
 680 = 86D7 4
 690 = F38F F
 700 = E38E 9
 710 = CFD9 B
 720 = 5C2C A
 730 =  DF4 F
 740 = E17C 5
 750 = C4E9 C
 760 = ED3A 1
 770 = 6D9C 1
 780 = 129C E
 790 = 8D4C 6
 800 = AB33 B
 810 = EE84 2
 820 = 6CA9 3
 830 = D50A 7
 840 = B83C C
 850 = 70AF 8
 860 = 92DF D
 870 = ED0F 2
 880 = 670C 8
 890 = 13B2 C
 900 = 7C31 0
 910 = BAF5 A
 920 = D606 1
 930 = ED0F B
 940 =  E46 7
 950 = E689 8
 960 = 4B9B E
 970 = ED0F 6
 980 = 8B82 1
 990 = 3607 0
1000 = EACF 1
1010 = ED0F 1
1020 = 6165 1
1030 = DFF9 D
1040 = 5368 F
1050 = 4740 0
1060 = ED0F 5
1070 = FD92 1
1080 = 97BD 2
1090 = 1BD0 0
1100 = F77E 7
1110 = 3D42 A
1120 = ED0F 0
1130 = E26D 3
1140 = 956C 4
1150 = ED0F 7
1160 = E7E7 D
1170 = 94E8 0
1180 = E93B 5
1190 = 8FF7 D
1200 = AF76 1
1210 = 1680 6
1220 = BA1F 4
1230 = 3704 6
1240 = 2201 E
1250 = D818 7
1260 = 812B 7
1270 = 81AD 3
1280 = 6A2B D
1290 = C0CB F
1300 = BC15 3
1310 = 92D2 D
1320 = E432 1
1330 = 786B B
1340 = 7E41 3
1350 = D9B3 B
1360 = 626A 7
1370 = 5020 D
1380 = 40D0 2
1390 = AC2A 8
1400 = 54F1 E
1410 = CF9B D
1420 = 5349 B
1430 = 2707 1
1440 = 58C8 9
1450 = 3B34 7
1460 = 7F4D 6
1470 = 2F6C 2
1480 =    0 2
1490 = B53C 0
1500 = E531 5
1510 = CF0A A
1520 = 3646 0
1530 = 7623 0
1540 = 1A63 E
1550 = 8E45 C
1560 =  A5F E
1570 = 3079 8
1580 = 269D A
1590 = 465B 4
1600 = 7461 4
1610 = 8949 A
1620 = 567A 2
1630 = 7C0E F
1640 = F9ED E
1650 = 4E8B 0
1660 = 567A 1
1670 = 285D 5
1680 = AD39 C
1690 = 6007 E
1700 = 465B E
1710 = 2A6D 7
1720 = C2F2 F
```

Has upgrading your BBC Micro given you hardware you no longer need? Or have changing interests left you with unwanted software?

MICRO USER CLASSIFIEDS

● BBC Master 128K. 14" Thomson Colour Monitor. Midwich Twin 40/80 Disc Drive. Canon PW1080A printer on stand. All on wheeled trolley. Rom cartridge DFS/ADFS Wordwise View Viewsheet. All manuals. Lots of software, games, educational and business. Blank discs. £500. Also BBC B. 40/80 Disc Drive. Logo Roms and manuals plus other software. £150. Offers for both considered. Durham: 0388 731430.

● PC Emulator V.1.7 MS-DOS £60 ono. Tel: 0282 694124 Evenings.

● A3000 Learning Curve, colour monitor, 4MB Ram, midi interface, other software, £700 Tel: 051 426 1506.

● BBC software cheap, genuine, great range, For List SAE:- Clive Roberts, 210 Hern Road, Ramsey St Mary's, Cambs, PE17 1TB.

● A3000, colour monitor, Panasonic KX-P1081, trolley 1st word +, Artisan any reasonable offer. Tel: 0258 452 876.

● Exmon II, Dumpmaster, Procyon, Help II, UserRom, Sleuth(2) toolkit (2), viewsheet, viewstore ROMS with documentation £10 each including documentation Ring Bob 0296 24498.

● BBC B + 128K, Cumana DSDD40/80 Microvitec monitor, Panasonic printer, printer stand, Acorn 1770DFS, ATPL Rom board, Interword, Questpaint, Conquest, MAX, PMSNTQ1, PMSNTQ2, Dumpout 3, GXR, 150Pascal and all manuals. £550ono 0926 338170 after 7 pm.

● 3mb Morley plug in Ramboard for: Archimedes £100 ono Archimedes games and educational software. 0926 881507.

● BBC B with Watford 1772 DDFS, Watford 3.5" 5.25" twin disk drive plinth (DP35-8005), Acorn (Hitachi) 12" colour monitor with swivel stand, Voltmace D38 joystick, manuals, games, spare disks, storage box, all like new in original packaging £350 Tel: 0342 316 314.

● BBC B Series 7 £80 ono Tel: 0767 23581 between 5 pm and 8 pm.

● Master 128 40/80 drive with reference manuals as new complete with View Viewsheets and Editor £300 TV/monitor and FT5001 multi mode serial impact dot matrix printer available 0243 670 822.

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Improving production

Taking a look at the new version of AIM, Steve Bruntlett highlights the improvements of this powerful image processing package

Product: AIM II
Price: £29.38
Supplier: Lingenuity, Wood Farm,
Linstead Magna, Halesworth,
Suffolk IP19 ODU.
Tel: 098 685460
Requirements: Risc OS, 2Mb

THE original AIM has been enhancing scanned images for some time now in the public domain. The manual was an on-disc Edit text file which I seem to remember took forever to print out.

This newer, multi-tasking version, needs a minimum 2Mb machine and offers an extended range of options: Advanced help messages, editable macro-files, the ability to save window contents as sprites and it works in any screen mode.

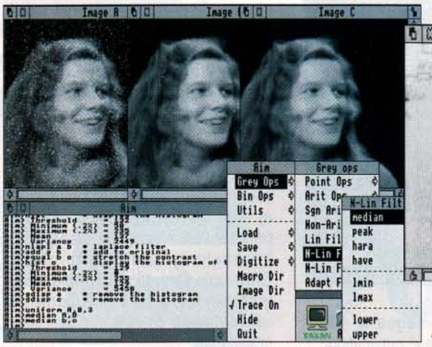
AIM II comes with a clearly printed A5 manual in a standard plastic wallet with comprehensive introductory, historical, reference and tutorial sections. This is a piece of scientific software which may be outside the scope of the home user unless you want to become involved in image analysis and have access to a digitiser. Yet it's certainly worth exploring.

It was developed from the Unix program TCL Image which is also available from Lingenuity and runs on the Acorn RISC iX platform in the X-Windows environment. The review version came with a set of example images and treatments in the form of macros. These can be used alongside the set of tutorials to see what the program can be used for.

AIM II treats images from a wide range of sources, including images from most of the digitisers currently available. It also works directly with a variety of digitisers, such as the original Watford digitiser – 256 x 256 x 64 grey scale; the current series of Wild Vision Hawk digitisers, which have a resolution of up to 512 x 512 x 256 grey scales, as well as Snapshot which is produced by Lindis. With a similar resolution and grey scale it has recently been reduced in price to £199.

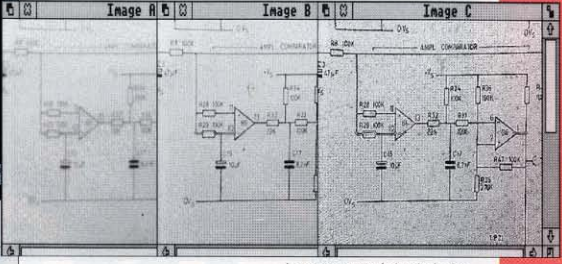
All these digitisers have a special AIM file saving option. If you use images from other digitisers they need to be converted to AIM format using !ChangeFSI. This utility has an AIM file export format and is also available from Acorn or Lindis for £22.

If you have access to such, you can also use scanned images and images from weather satellites. Once treated you can change them to sprites for use in DTP or paint packages again using ChangeFSI. What would we do without it?



```
Aim> Threshold     = 132
Aim> Minimum (.2%) = 38
Aim> Maximum (.2%) = 235
Aim> Mean          = 137
Aim> Variance      = 2449
Aim>nlapl a b   : laplace filter
Aim>add a b     : add to original
Aim>equal b o   : stretch the contrast
Aim>hist o      : display the histogram of t
Aim> Threshold     = 129
Aim> Minimum (.2%) = 0
Aim> Maximum (.2%) = 255
Aim> Mean          = 129
Aim> Variance      = 5458
Aim>gdisp a     : remove the histogram
Aim>gdisp o     : remove the histogram
Aim>
Aim>uniform A,B,3
Aim>median A,B
Aim>median B,C
Aim>
```

Removing Bernadette's spots



Improvement of circuit design

Using AIM II is straightforward. Loading on to the icon bar in the same way as other Risc OS programs it has the added advantage that you can hide all the current work if you want to do something else and go back to it at any stage by clicking on the AIM II icon.

The AIM II system consists of four working windows for comparison and progressive treatment of images, as well as a command window which displays commands selected from the range of option menus or into which you can type commands directly. You can also drop them in from a text editor having used it to assemble a set of commands into a macro.

So what does AIM II actually do? The best place to start on seemingly such a comprehensive program is with the demonstrations. These explain how the program operates and illustrate some of its features.

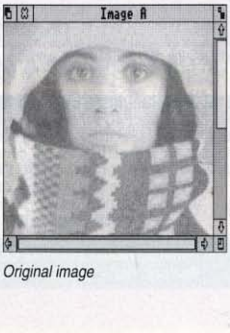
Powerful

The first demonstration involves histogram equalisation by showing this effect on part of the leg of a moonlander. In the original image it's difficult to make out as the grey scale is very compressed.

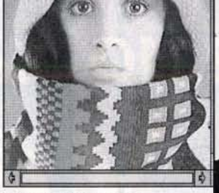
By spreading it out, however, it's much easier to see and a lot of *hidden* detail now becomes apparent.

The second demonstration increases the contrast of a picture of Trudi. By performing grey-value operations on the original image it works very effectively. I can definitely see uses for this, where images have been digitised in a low-light situation and you need to do some post production to improve the contrast.

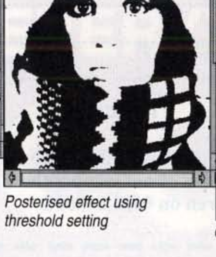
The third demonstration involves treating Bernadette's spots. This is done by using a low-pass linear filter to remove white shot noise. The effect of this first pass can be seen on the middle picture while the effect of the second pass can be seen on the third. This would seem to be very useful on those digitised images pro-



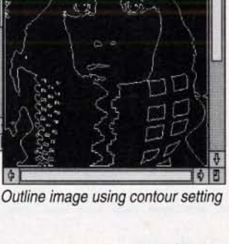
Original image



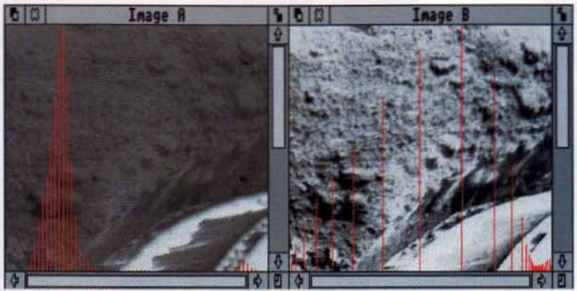
Improved image using increased contrast



Posterised effect using threshold setting



Outline image using contour setting



Moonlander histogram equalisation

duced with dodgy video cameras where there was a degree of interference.

Down to basics

So what does Image Processing involve? Well, it comprises four main activities:

Image Analysis The production of data representing some features of the image.

Image Handling Involves the use of images in databases.

Image Editing Concentrates on the enhancement of images to make them suitable for use in publication.

Image Creation The use of Image Processing operations to create an image with specific or unexpected effects.

These last two are perhaps of most interest so let's see what's on offer.

The manual describes some applications of Image Editing and goes through the options available. This does start to get a bit complicated – especially when it talks about morphological operations or the use of Laplacian filters – but it does give clear examples of the use of each of the operations used in the different stages. This section is well worth reading on its own.

But I suspect the best way to use it, is to try it in conjunction with the processing of an image as you might do by going through the demonstrations provided.

So what can AIM II do for the rather flat picture of Trudi? As well as improving the contrast of the image – as dealt with above in the demonstration section – you can also set its threshold by using the threshold Grey-value Operation. This makes all greys on either side of a particular user-set value change to either black or white.

You can also achieve outline effects as illustrated by using the contour Binary Operation. But I suspect that using AIM II is a complicated way of manipulating graphics and this kind of work is probably far more easily done with a graphics package.

Where I think AIM II does score is in improving fairly bad images to a state where they can begin to be used – for instance the image of the circuit diagram which has had two successive *enhance* Linear Filters applied to give a reasonably clear image. Though having said this, the manual does make it very clear that it's better to re-grab the image at the time if possible.

You may be able to get a better image that way rather than by trying to improve the image using this program.

Summing up

AIM II is a fascinating program to use. Although it does highlight what kind of improvements can be made to a digitised image, I'm not sure that I'd use it in preference to a good art package that allowed posterisation, edge detection and good tracing facilities.

It does, however, score very well in its ability to clean up and enhance poor quality images before you transfer them to an art package for creative work.

If you are interested, AIM II is a well presented package and well worth the cost for the improvements and extensions to the original and also for a very useful and informative manual.

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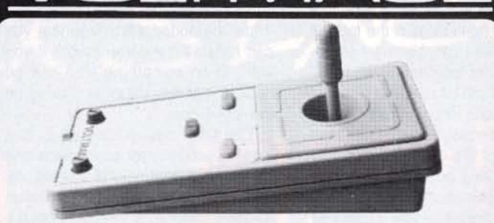

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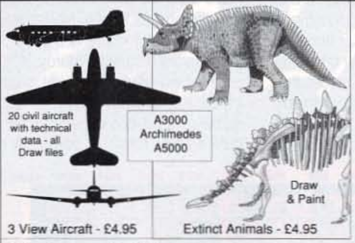
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Did the Earth move?

Mike Cook builds his own swingometer

I AM sure that, by now, you will have had enough of general elections and are looking forward to a few years' rest. Well, this month's project was not inspired by watching the swingometer on election night but rather by the recent earthquake in Peterborough.

It is a seismometer that can be used for a number of different purposes. For example, it can spot land settlement due to mining subsidence and the passage of cars or trains close by. It can even be used to detect the patter of hundreds of not-so-tiny feet during lesson changes in a school.

Let's look at the anatomy of an earthquake, shown in Figure I. The quake happens because of strains in the earth's crust which suddenly gives way and causes a shock wave. This can travel in a number of different ways.

First the surface wave is propagated along the surface of the earth. However, the initial quake sends down shock waves deep into the earth.

P and S waves

These get partially reflected from different density layers and arrive some time after the surface wave. There are many such waves but two prominent ones are called the P and S wave. If the earthquake is a long way off these can arrive several minutes before the surface wave as they travel more directly.

One way to detect these is to use a pendulum – the idea is shown in Figure II. A magnet is suspended from a thin nylon line, over a coil. Any movement of the magnet will cause magnetic lines to cross the coil windings and generate an electric current. We can then record this with our computer.

The secret of success is to have the whole arrangement firmly attached to a solid support like a concrete floor. The longer the tube, the more sensitive it will be but also the more prone to local disturbances. A tube of about 1 metre is a good compromise but it must be sturdy.

The best place to mount it is in a cellar if you want to detect earthquakes, but it could be anywhere to detect other forms of tremor. A telephone pickup coil, available from Tandy or Maplin, is effective, and comes with a rubber sucker attachment which you will need to remove. I found it best to break the plastic case carefully and extract the coil. In the centre of the coil is a soft iron core which helps improve the magnetic coupling, but it also attracts the magnet and produces damping in the pendulum.

Keep it down

Damping is important: It's the time it takes the pendulum to settle down and be ready to record the next shock. However, too much damping and you will reduce the sensitivity. By pushing the core further into the coil you can reduce the damping to suit you. I found that about one third the way in was optimum.

Place the magnet on the coil and attach the thread with epoxy or hot melt glue. Then pull the thread so that the magnet just hangs over the coil. Now you can tape or glue the other end of the thread to the top of the tube. It is simpler if you can look at this process. To do this, drill an observation hole in the side of the tube – it can always be covered with tape afterwards.

Figure III shows the electronic amplifier. You will need to connect it to the joystick (analogue) port of your computer. It is basically a differential amplifier with a large gain. In a differ-

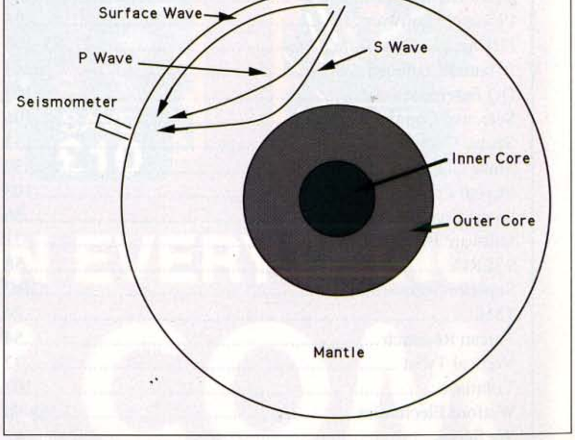

Figure I: The anatomy of an earthquake

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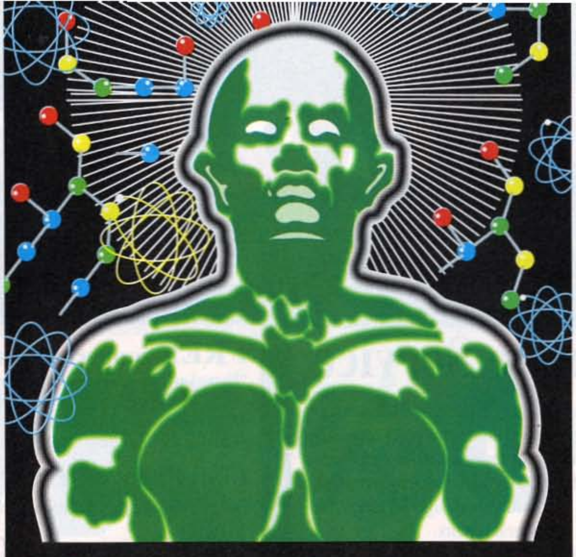

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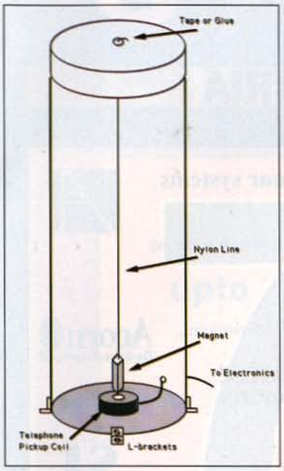

Figure II: The pendulum detector

ential amplifier we take two inputs and only amplify any difference between the two. This eliminates pick up interference on the wires connecting the coil and the amplifier, because it will be the same on the two inputs.

The two inputs are first amplified and then fed to the differential inputs at points A and B in the circuit. Then they are applied to the differential amplifier and the output of that is connected to another amplifier with a gain of about 50 to boost the signal level.

Smooth the output

We don't want a signal representing the actual swing of the pendulum but rather a signal that represents the amount of swinging it does. To do this we have to smooth the output by using the 1M resistor and 1uF capacitor. This signal can then be fed to the analogue input of the computer.

Like most operational amplifiers, these require a split supply. This is achieved here by having two 4K7 resistors splitting the supply and providing an artificial earth.

The sort of signal the computer requires is zero volts when there is no swing and a voltage that increases with swing. Well, if you were looking at this circuit you might expect that with no swing you would get half the supply on the output, namely 2.5 volts.

In a perfect world you would, but any real amplifier has a very small voltage on its input produced by internal leakage. This is called the DC offset. This is also amplified along with any signal causing a DC shift in the output.

Normally this is a problem, but here we can use it to our advantage.The DC offset forces the final amplifier to sit at zero volts when there is no input. Any input from the coil will overwhelm this offset and we will get our signal.

However, this relies on the DC offsets being in the correct direction. If they are in the opposite direction the output will sit at 5 volts all the time and make negative excursions.

As the computer's input only works up to 1.8 volts this requires a lot of swing before it will register. Therefore if you make this circuit and find the output sits at 5 volts all the time, swap over the input amplifiers. This can be done simply by changing over the inputs to the differential amplifier at points A and B on the circuit. In other words the end of the 10K resistor connected to point A should be connected to point B and vice versa.

The amplifier should be built on veroboard. The layout is not too critical but try to make the differential part as symmetrical as possible. This comes as a natural consequence if you follow the pinout shown. The telephone coil has a jack plug moulded on the end of it and it is probably best if this is cut off and the wires soldered directly to the board. There is not room to print the layout here but it is included if you buy the components as Body Build pack No 77.

You need some form of analogue input to your computer. The joystick input can be used on all computers except the Compact in which the joystick input is digital. Also the Risc OS computers need to have a joystick input fitted as an option. For this you will need Acorn's I/O podule or a third-party equivalent.

You can't use a joystick interface that emulates the mouse as again this is digital. As an alternative you can use the I²C interface board, either the AnDi Oddule or my own Body Build pack 73 from May 91.

The software is simple and it should be no problem to write – any one of a number of data logging programs will do. What you need to do is to look at the input every second and average 10 seconds or so of readings. Then plot them on the screen and store them on disc for later use. It's the sort of thing that is ideal for a school project.

● *Well, there you have it a seismometer that can be used to detect earthquakes or the slamming of the door as your loved ones return from a hard day. Come to think of it, it's the same thing, isn't it?*

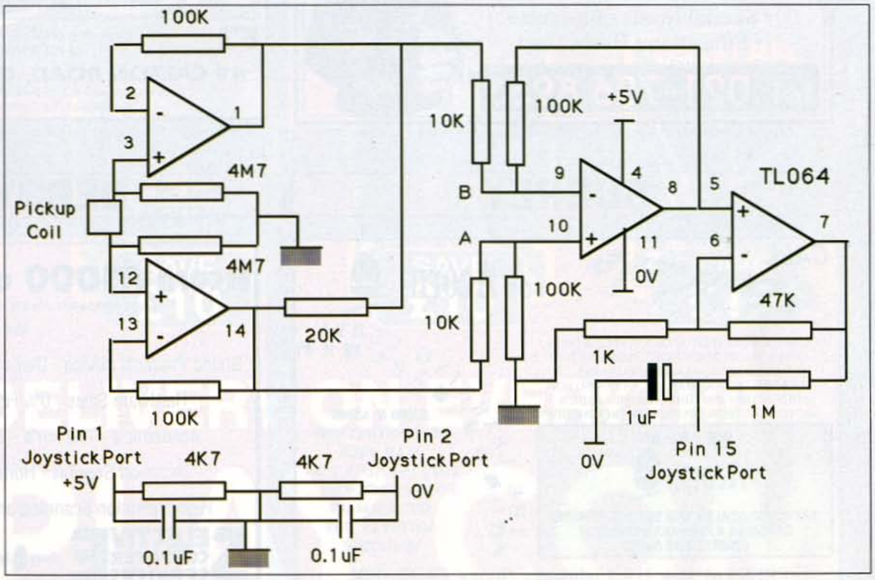

Figure III: Circuit layout for the electronic amplifier

The Micro User gui

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Work with wimps

I RECENTLY bought an BBC A3000 which has worked perfectly until just recently when a few things have been cropping up. I often get Address Exceptions while in the Desktop.

Also, while writing a Basic program to make use of the Draw module I had a procedure to set things up and when it reached the ENDPROC I again got an address exception.

I wonder if you know any books that show Wimp programming with slightly simpler explanations than the Programmer's Reference Manual. – **C. Wiggins, Foxton, Cambridge.**

● Although it's hard going, the Programmer's Reference Manual is the best guide for the things you're attempting, so persevere. If you want a simpler way of accessing the Wimp and such like, try Helix Basic from Craddock Computer Services – it handles all these problems for you.

As for your specific problems the Address Exception error occurs in two situations: Although your micro may only have 1 to 4Mb of actual memory the ARM processor can handle 64Mb.

What occurs is that Risc OS keeps moving the memory pages around. If you try to read or write to a memory address that doesn't have any actual memory at that position, an error is generated.

The other time it can happen involves one of the four operating modes the processor can have: User, Supervisor, Interrupt and Fast Interrupt. Certain areas of memory are given an access level. Ordinary application space is at the user level which means that it can be accessed by a routine running in any mode, but if memory is protected you can't access it if you're running in User mode – which Basic is.

The problems you're having with the draw routines will certainly be due to some programming error. The Desktop problem is probably due to a bug in Filecore because it can only handle eight discs, any more generates the fault. Make sure you always dismount discs when you've finished with them.

MultiFS musings

I WONDER if you can give me some help on using MultiFS as supplied with the new Learning Curve PC Emulator upgrade pack.

I have managed to get the emulator side going with no bother, however the MultiFS side has me foxed. My problem is not really knowing what I should get as a result of the program.

When I run MultiFS I get the window showing the Dos files but when I try to open the Dos file I get an error. – **Paul Rowe, Southport.**

● Just as you can take a horse to water but fail to get it to drink, so you can use MultiFS to put a PC file on to a Risc OS disc but fail to get it to work.

You see each PC application saves its files in a format only it understands. You can transfer this file on to a Risc OS disc but the data from it is still in the original format and you need a Risc OS program that understands data in that format.

For example, Schema will understand transferred Lotus 1-2-3 files because it is designed to do so. Similarly Acorn DTP will accept TimeWorks files. And you'll have no trouble with 1st Word Plus as versions exist for Dos and Risc OS.

Lastly, Impression from Computer Concepts will handle a wide range of PC word-processor files – it's well worth a look.

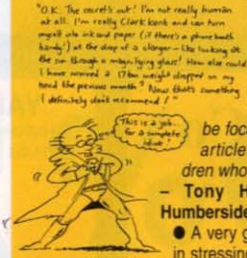
Pet micro

With regard to your March 1992 article, in which you say that Commodore hadn't been heard of in the early days, I enclose a photo of my first micro, bought in March 1982, a Commodore Pet 2000 – 8k for £600.

I also was one of those who paid for the BBC Micro and then waited eight months for delivery. I now have an Archimedes 420. – **F. King, Dewsbury, West Yorkshire.**

● Yes, we rather overlooked the venerable Pets.

Safer Scientist


"O.K. The secret's out! I'm not really human at all. I'm really Clark Kent and can turn myself into ink and paper (if there's a phone booth handy!) at the drop of a clanger – like looking at the sun through a magnifying glass! How else could I have survived a 17ton weight dropped on my head the previous month? Now that's something I definitely don't recommend!"
This is a job for a complete idiot!

THE Safe Scientist *in your March 1992 issue is not safe. Looking at the sun through a magnifying glass is dangerous. Okay, so in the picture he could be focusing it on his nose, but the article is aimed at younger children who may not know these things.* – **Tony Haines, Hessle, North Humberside.**

● A very good point. We join with you in stressing that no one should look at the sun through a lens, binocular, telescopes and such – it can cause permanent eye damage.

Small print

I TOOK out a subscription to The Micro User *about six months ago and I think that the PD part of the monthly disc has good programs on it. However one problem I used to have was that if I loaded up !FileUtils and !Guardian and a couple of other applications I run when I have the computer switched on, I run out of memory – I only have 1 Mb.*

This means that I cannot load the printer driver and/or !Edit giving me the problem that I cannot print out the !Help or !ReadMe files which come with the programs.

To overcome this I have found a way of printing out these while in the Desktop using only 1k of RMA space – opening a window. Press F12 – or use New Task from the Task Manager – and enter:

```
*Filer_OpenDir Printer:
```

A window appears on the screen called Printer: *– which is a directory viewer for the printer. When you want to print something out, just drag that file to this window and it will be dumped to the printer.*

You can even print out !Run files and such, but look out for control codes – they may Form Feed you through 30 sheets!

If you want to check the files for control codes or just to see if they contain what you think and you cannot see them by double-clicking them (like !Run files) use the same method for opening the printer: *window but replace:*

```
*Filer_Opendir Printer:
```

with:

```
*Filer_Opendir vdu:
```

and drag the file you want to that window.

Be careful that you do not hold Shift down when you are dragging the files or you will move them to the printer or screen and lose them forever. – **Miles Carter, Chandlers Ford, Hampshire.**

● You can also use:

```
*Filer_OpenDir null:
```

And then dragging *with* Shift held down will let you delete files even if they are locked.

Upgrading

AT present I have a PC emulator version 1.34 and DR Dos version 3.4. Using this software, would it be possible to run games like Monkey Island, Heart of China or would I need to upgrade my emulator to the latest version?

Would I have to upgrade my version of DR Dos to version 5.0 as well? – **John Fairweather, Elgin, Moray.**

● You will need a 2Mb machine but the new version of the emulator is well worth it. Equipped with this kit you should have no problem running your games, though they'll run a lot slower. Perhaps you could upgrade to an Arm 3 or get one of the new PC boards.

Re-ARMing

As a proud owner of a 2Mb A3000 I have sat through many excellent demos and afterwards wished I could also produce results like these.

Now, as my 15th birthday is coming up I would like to buy some manuals on BBC Basic V and ARM code. What can you suggest? – **Simon Naisbitt, Sale, Cheshire.**

● For experienced users the best guides are the Acorn Basic V manual and the four volumes of the Programmer's Reference Manual.

These are fairly hard going. An easier option is to buy *Archimedes Assembly Language*, *Archimedes Operating System* and *Basic V* all from Dabs Press. They're a lot cheaper than the Acorn books – as you'll see from our Reader Offers page – but not as comprehensive.

Demo dilemma

I'VE always been a big Acorn fan and until recently I have owned a BBC Micro. I have now gone with the flow and have upgraded to an Arc.

When I had my Beeb I was the laughing stock of the whole street as everyone had either Amigas or STs. My reply to the street was Wait until I get my Arc.

Now I've got it my friends have started showing me demos such as Digi Concert and Star Trek. What I need are a few really good sound and graphic demos to show that my Arc surpasses the Amiga and ST. Could you please help? – **Simon Wells, Barrow-in-Furness, Cumbria.**

● Try Public Domain libraries such as Arcaynia, Skyfall,

Socket solution for Mini Office II

I THINK I may be able to throw some light on the problem Bryan Edbrooke is experiencing with his Mini Office II program (March 1992), as some time ago I came across the same problem.

First the bad news: Things get progressively worse. For instance it will not allow you to edit at all, then it changes letters at random through the text you are typing. Finally the program refuses to run at all.

Now for the good news: The problem appears to lie not with the disc but with the computer. The solution in my case was to replace the 74LS245 chip in socket IC14, preferably with 74ALS245. If he has an issue 4 board it is soldered to the mother board but if he has an issue 7 board it is a push in. – **B. L. Jackson, Holyhead, Anglesey.**

Prime and Diamond and you'll soon impress your friends. There's plenty of stuff you can download from bulletin boards as well.

Disc update

I'M having problems on my Archimedes with the March disc. The demo Bobby Blockhead doesn't seem to work. Also the Rom and Ram programs do not run. – **P. J. Devine, Woking, Surrey.**

● Sorry about that. The March Rom and Ram programs are not for the Archimedes and shouldn't have been included. You need to unpack Bobby Blockhead on to another disc with !ArcFS then it will work fine.

Unplugged

I'VE had problems with games screens recently: They stop while loading displays with error messages like File 'Screenload' not found. *What's going on?* – **Danny Howden, Somerset.**

● What almost certainly has happened is that your SpriteUtils modules have been unplugged by a naughty game. If you enter:

```
*unplug
```

you'll see a list of the modules that are missing. Reinitialise the modules with *RMReInit as in:

```
*RMReInit SpriteUtils
```

Quick update

I WAS intrigued by Stephen Ramplin's Quick Type utility in the January issue of the Micro User *having originally been an Electron user.*

However, as 19 Basic keywords can already be typed in with two key presses – for instance P. for PRINT – I decided to revamp the program to replace words with ones requiring more keypresses.

In my innocence I thought it would be a simple case of changing the Data statements, as I still have a list of the token numbers from my Electron days, but no such luck. As soon as I changed even a single data item I got the Data Error message. – **Dennis Hatfield, Hull.**

● The program has an internal checksum routine in lines 320,330 to validate the tokens data. Leave out the IF statement involving *C%* from line 330 and you can disable this feature.

Missing memory

I bought an A3000 Learning Curve mainly for my daughter to use and have also bought a couple of items of educational software.

One problem we find is that after using one disc and inserting another we often get the message Application requires 512k (or 640k) to start up.

This problem can always be cured by switching the computer off and on, but this does not always seem a satisfactory solution.

It's obviously caused by the previous application still occupying part of the memory and leads me to suspect that to take full advantage of the A3000's capability at least 2Mb are required. – **John Turley, Dronfield Woodhouse, Sheffield.**

● This sounds like a problem with RMA modules. Your program is probably loading them in and then, rather untidily, leaving them there when the main application is quit – using up valuable memory.

You can see this in practice by using *Modules to see what's there before you run your software, then running it and investigating what happens with *Modules again. You'll be able to see the culprit and can kill it with a *RMKILL.

A much simpler solution is to upgrade to 2Mb – you'll find yourself a lot less cramped.

ALL programs printed in this magazine are exact reproductions of listings taken from running programs which have been thoroughly tested.

However, on the rare occasions when mistakes occur corrections are published as a matter of urgency.

Should you encounter error messages when you type in a program, they will almost certainly be the result of your own typing mistakes.

Unfortunately we cannot answer personal programming queries concerning these mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in the letters pages.

WANT to write to The Micro User? The address is:

Letters, The Micro User, Europa House, Adlington Park, Macclesfield SK10 4NP.

Writers of the most interesting letters receive a £10 prize.

Flicker-free Pipedream

THANK you for John Allen's very positive review of PipeDream 4 in your February issue. He mentioned that he was reviewing one of the pre-release versions and so was not able to use the new charts to their full extent.

PipeDream 4.12, with completed charts, was launched on 10th February and all users of PipeDream 4 are welcome to a free upgrade simply by returning their program and examples disc to us with a stamped-addressed envelope.

The only minor drawbacks John noted with PipeDream 4 were difficulty in transferring text to Impression and a slightly flickery display when scrolling, if another window was overlapping the PipeDream window.

Since version 4.10 we have been providing a PipeDream to Impression converter program which takes all the work out of the transfer. The flickery display was a result of the background redraw which, in common with PipeDream's unique background calculation, gives the user control of the computer while PipeDream is processing.

We have fine-tuned the background redraw in version 4.12 and it no longer flickers. – **Robert Macmillan, Coltonsoft. Cambridge.**

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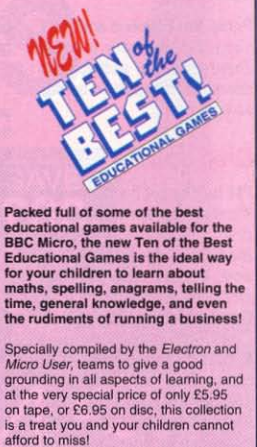
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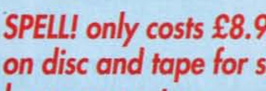

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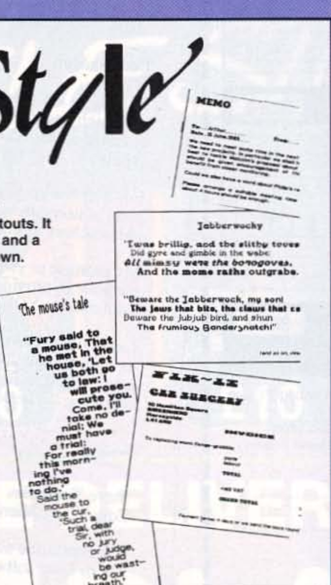

MEMO

Jabberwocky

'Twas brillig, and the slithy toves
Did gyre and gimble in the wabe:
All mimsy were the borogoves,
And the mome raths outgrabe.

"Beware the Jabberwock, my son!
The jaws that bite, the claws that ca
Beware the Jubjub bird, and shun
The frumious Bandersnatch!"

The mouse's tale

"Fury said to a mouse, That he met in the house, 'Let us both go to law: I will prosecute you. Come, I'll take no denial: We must have a trial: For really this morning I've nothing to do.' Said the mouse to the cur, 'Such a trial, dear Sir, with no jury or judge, would be wasting our breath.'

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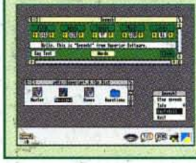

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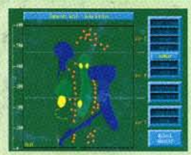

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